Gold Standard for the Global Goals
Key Project Information & Project Design Document (PDD)

Version 1 – July 2017

Gold Standard

KEY PROJECT INFORMATION

Title of Project:	LAKE NAIVASHA BASIN REFORESTATION PROJECT
Brief description of Project:	The Lake Naivasha Basin Reforestation Project has been funded as an insetting project by Coop Switzerland. The project intends to work with commercial flower growers and smallholding farmers located within the Lake Naivasha basin to promote new tree planting activities, the rehabilitation of natural vegetation, productive reconversion and improved water resource management. The project will last for 30 years from 2018 to 2048, however planting will only be conducted during the initial three years, from 2018 to 2020. The reforestation target area is 1,000 hectares of individually owned farms under both woodlots and agroforestry management systems. The selection of planting areas is based on land availability, eligibility, consent and commitment of the individual landowners, land tenure system and the capacity of the local WRUAs and CFAs to continually monitor and submit data during the project lifetime. The community institutions, together with their members, will decide on the specific clusters, vet individuals and establish landownership systems where farmers are going to grow trees. This will make it easier for them to link with individual participating farmers and maintain records for the purpose of monitoring. Planting will be done in two management. Individual farmers and selected institutions will enter into a mutual agreement with WWF-Kenya, specifying the rules of engagement, confirming participation and accepting the gold standard terms.
Expected Implementation Date: Expected duration of Project:	2018 30 years
Project Developer:	WWF Kenya
Project Representative:	Swiss Carbon Value Ltd. (South Pole)
Project Participants and any communities involved:	Project Representative: Swiss Carbon Value Ltd. Contact: Tanushree Bagh Address: Technoparkstrasse 1, 8005 Zurich, Switzerland e-mail: t.bagh@southpole.com Phone: +41 43 501 35 50 (reception) Project Participant: WWF-Kenya Contact: Mohamed Awer Address: The Mvuli, Mvuli Road off Raphta Road, Westlands, PO Box 62440-00200, Nairobi, Kenya e-mail: mawer@wwfkenya.org Phone: +254(0)722203407+ 254(0)733333409 In addition, small and medium landowners that belong to Kikuyo and Masai communities will be directly involved in the reforestation activities in their areas.
Version of PDD: Date of Version:	1 April 2018
Host Country / Location:	Kenya/Nakuru County in the catchment for Lake Naivasha
Certification Pathway (Project	Impact certification

Certification/Impact Statements & Products	
Activity Requirements applied: (mark GS4GG if none relevant)	Land-use & Forests Activity Requirements
Methodologies applied:	Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Product Requirements applied:	Gold Standard Emissions Reduction and Sequestration Product Requirements
Regular/Retroactive:	Regular
SDG Impacts:	#6 Clean water and sanitation #13 Climate action #15 Life on Land
Estimated amount of SDG Impact Certified	SDG 13: 178,347 tCO_2 No other SDGs have been estimated at this time.
For Land-use & Forest Projects only – delete if irrelevant	
Size of the Project Area and Planting Area:	1,000 ha (estimated)
Risk of change to the Project Area during Project Certification Period:	The project implementer will identify at least 1,000 ha to be used to implement project activities in the initial three years, however there is a risk that the project area will not secure all 1,000 ha due to social risks. These risks could be caused by other programmes, projects or activities with different organizations. In addition, there are environmental risks. Long drought periods and landslides can affect the project area causing mortality of the trees planted.
Risk of change to the Project activities during Project Certification Period:	The main risk of change in the project activity is the opportunity cost. (i) Urban expansion: Some of the planting areas are close to urban centres. In this case there is a potential risk that the landowner may sell their land due to an increase in its price. Therefore, urban expansion (development) is the main potential problem. If owners sell the land, the new owner can harvest the trees on the property and implement different land use. Every county has a spatial plan (Territorial Ordering Plan), which is used to identify the land use of in certain areas (for instance, to identify where to build infrastructure, plant crops or forests, etc.). This plan can be used to mitigate this risk. (ii) Other development opportunities: The opportunity cost of the land can also be a risk because the beneficiaries can change the land use activity to a more profitable one. This can be mitigated through the selection of agroforestry systems in small pieces of land instead of woodlots to increase the ability to produce a variety of goods from the same land.
Land-use history and current status of Project Area:	According with WWF (2012), land users in the Lake Naivasha Basin include traditional pastoralists to subsistence and smallholder farmers, dairy and beef farmers, and high-tech international commercial vegetable and cut flower farming operations. The lake itself is internationally renowned because of its biodiversity and natural beauty. It attracts thousands of local and international tourists. To the south of the lake, close to Hell's Gate National Park, geothermal steam is harnessed to drive electrical turbines, which contributes electricity to the national grid. The land cover types in the Lake Naivasha Basin are determined, to a large extent, by the topography. Lower elevation areas surrounding Lake Naivasha are predominantly shrubland with extensive built up areas (including Naivasha town). There is also perennial cropland, including many commercial growers of horticultural and floricultural crops, which are sold in international markets. Smallholder farmers mostly use the middle elevation areas for annual cropland. The higher elevation areas support permanent natural and planted forest. This

<table>
<tr><td></td><td>is found mostly on the eastern side of the catchment zone in the Aberdare Mountains. These mountains provide the source for many of the rivers that feed into Lake Naivasha such as the Malewa River, which provides up to 70% of the lake's water.
The upper catchment of the basin, which has historically consisted of indigenous forest and open woodland, has also experienced significant changes in land use over the past 50 years. The forest has been converted into rainfed smallholdings. This has had a direct impact on the water resources of the lake.
This deforestation has had a marked effect on the hydrology of the basin as flows have become more extreme with intense flooding in the wet season and low volumes in the dry season. This rapid runoff has led to higher rates of siltation, while water quality concerns have been further compounded by poor farming methods in the upper catchment zone. The use of fertilizers to improve crop production and farming, and overgrazing of riparian areas has increased siltation, nutrient loads and turbidity.

A breakdown of land cover types in 2016 is shown in Table 1.

Table 1. Land Cover type by area in the Lake Naivasha Basin (2016)
<table><tr><th>Land Cover type</th><th>2016 area (ha)</th><th>Cover % (2016)</th></tr><tr><td>Annual cropland</td><td>155,320</td><td>45.2</td></tr><tr><td>Built up</td><td>2,720</td><td>0.8</td></tr><tr><td>Grassland</td><td>15,865</td><td>4.6</td></tr><tr><td>Natural forest</td><td>36,324</td><td>10.6</td></tr><tr><td>Perennial cropland</td><td>7,629</td><td>2.2</td></tr><tr><td>Planted forest</td><td>6,127</td><td>1.8</td></tr><tr><td>Shrubland</td><td>103,299</td><td>30.1</td></tr><tr><td>Waterbody</td><td>13,953</td><td>4.1</td></tr><tr><td>Wetland</td><td>2,066</td><td>0.6</td></tr><tr><td>Total</td><td>343,303</td><td>100.0</td></tr></table>
Source WWF-Kenya (2016)</td></tr>
<tr><td>Socio-Economic history:</td><td>The economy of the basin is based on the agricultural sector. The commercial horticultural sector in the Naivasha catchment area employs approximately 25,000 people directly and an additional 25,000 indirectly. Furthermore, in 2012, the Naivasha Basin area accounted for 20% (KSh 3.2 billion and 16,500 tons) of Kenya's vegetable export, the majority of which is used for domestic consumption. It contributes 70% of Kenya's cut flower exports. There are also currently three geothermal projects for electricity generation, construction and manufacturing activity is growing and, to some extent, the area has a developing tourism industry (WWF-World Wide Fund For Nature, 2012).</td></tr>
<tr><td>Forest management applied (past and future)</td><td>The area will be planted using two different management systems: woodlots and agroforestry. This will occur in the lower, middle and upper catchment areas. Planting of native and exotic species will happen in 2018, 2019 and 2020.
The rotation age and management will depend on the species and location of the plantation. For more details on the forest management applied, please refer to section A.5.</td></tr>
<tr><td>Forest characteristics (including main tree species planted)</td><td>The main tree species planted are: Casuarina equisitifolia, Grevillea robusta, Olea Africana, Prunus africana, Mangifera indica, Persea Americana, Dombeya goetzenii, Hagenia abysinnica, Acacia xanthophloea, Cupressus lusistanica, Pinus</td></tr>
</table>

<table>
<tr><td></td><td>patula, Juniperus communis, Ficus sycomorus, Juniperus procera and Podocarpus gracilior. Plantation density will be from 650 stems per ha for agroforestry to 1,100 stems per ha for woodlots.</td></tr>
<tr><td>Main social impacts (risks and benefits)</td><td><u>Risks:</u>
- In places where the land is very small like in the upper catchment area, the family will probably need to discuss the type of land use they will implement on the farm (such as for livestock, crop growth or planting a forest). For most instances in this society, men are the ones that traditionally have the final word on the decision made. This can cause conflicts within the family and women and children are excluded from decision making.
- Acceptance of the community to changes in land use resulting from the project.

<u>Benefits:</u>
- Without the project, firewood is available but the forests are far from most of the houses and women are responsible for collecting the firewood. With the project activity, the community will have firewood available on their farms which means they will have increased time to carry out other activities such as looking after children, raising chickens or growing crops. Also, carrying heavy loads of wood can cause health problems for the women, so having wood available in the farm will reduce these risks. Young girls also accompany their mothers to collect firewood. When they have to walk long distances this may result in girls missing school and having less time to complete schoolwork at the weekends.
As a result of having firewood closer to the family home, family members are likely to have more time to complete other tasks.
- With the project's activities (planting, pruning, and others) the family income increases and the family will have additional income in order to meet some unsatisfied basic needs.</td></tr>
<tr><td>Main environmental impacts (risks and benefits)</td><td><u>Risks:</u>
- The current productive activities carried out in the areas which are to be planted are transferred to other parts of the basin, and consequently impacts the natural ecosystems.
<u>Benefits:</u>
- Water retention, binding of soil particles, preventing soil erosion and improving the microclimate (as the temperatures get cooler). The trees also act as windbreaks.</td></tr>
<tr><td>Financial structure</td><td>For the first initial 7 years or until 42,000 tCO_2 are generated, Coop Switzerland will fund the reforestation project and the certificates will be used to offset their emissions. After this, the funding will come from the sale of the carbon credits generated by the project.</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Project Area:</td><td>The project area has not been defined yet because the project implementer is currently identifying project participants. However, it is estimated that 1,000 ha of land will make up the project area.</td></tr>
<tr><td>Planting Area:</td><td>To be defined, however the goal is to plant approximately 1,000 ha, starting in 2018 with 210 ha, then 540 ha in 2019 and 250 ha in 2020.</td></tr>
<tr><td>Eligible Planting Area:</td><td>According to the initial eligibility analysis, 263,840 ha of the basin area were non-forest land for more than 10 years prior to the project start date, and thus the area meets the eligibility criteria.</td></tr>
<tr><td>Modelling Units:</td><td>Modelling units (MU) are defined by the initial planting date, location in the catchment area (upper, middle or lower) and management selected (woodlots or agroforestry). This results in a combination of 18 MU. Below are tentative scenarios for the project, they are subject to change.

<table>
<tr><th>MU</th><th>Planting Year</th><th>Catchment position</th><th>Management System</th><th>Potential planted area (ha)</th></tr>
<tr><td>1</td><td>2018</td><td>Lower</td><td>Woodlot</td><td>7</td></tr>
</table>
</td></tr>
</table>

	2			Agroforestry	7
	3		Middle	Woodlot	18
	4			Agroforestry	24
	5		Upper	Woodlot	61
	6			Agroforestry	92
	7	2019	Lower	Woodlot	19
	8			Agroforestry	19
	9		Middle	Woodlot	46
	10			Agroforestry	62
	11		Upper	Woodlot	157
	12			Agroforestry	238
	13	2020	Lower	Woodlot	9
	14			Agroforestry	9
	15		Middle	Woodlot	21
	16			Agroforestry	29
	17		Upper	Woodlot	73
	18			Agroforestry	110
	Total				***1000***
Infrastructure (roads/houses etc.):	The main infrastructure found in the project area is farmers' houses and any other smaller constructions for animals, firewood storage and boreholes. That said, there are also urban centres, greenhouses for flower and agriculture production, roads, three dams that are under construction in the upper catchment area, rail line construction, geothermal plants and a business park that is under construction.				
Water bodies:	The lake is Kenya's second largest Ramsar site. This status demonstrates its international importance as a wetland. The lake also supplies drinking water to Nakuru and irrigation water to the horticulture and power generation industries, which are important nationally (Harper, 2002). Lake Naivasha is situated on the floor of the Eastern Rift Valley, at its highest elevation of 1,890 m. The valley floor is composed of a complex stratigraphy of volcanic and fiuvio-lacustrine deposits that were laid in Pleistocene times (Butzer, 1972) (Richardson, 1972). The underlying rocks are a complex and fractured mosaic as a consequence of this tectonic activity. They have a deep and wide aquifer. Water from the lake seeps into this aquifer (Gaudet, 1981) and moves through it, mostly likely southwards towards Longonot and northwards towards Gilgil (Clarke, 1990). The lake has no surface outlet. The catchment area on the north and north-eastern side consists of two long axial river systems: the Gilgil and Malewa (formerly Melewa). They drain into Naivasha as a result of past intra-rift faulting and of recent volcanic activity (Clarke, 1990). Their high altitude origin (> 2500 m; rainfall 1,100 mm ann -1 compared to 600 mm ann- 1 at Naivasha) makes them permanent, feeding Lake Naivasha mainly through surface flow (input calculated as 85% surface and 15% subsurface, (Gaudet, 1981)). On the eastern, western and north-western and southern side of the catchment area, no surface water reaches the lake (Figure. 2). Rivers, often clearly incised into the landscape, flow seasonally. Only the eastern stream, the Karati, reaches the lake during high rain. Other streams end before reaching the lake, such as the Marmonet from the Mau Escarpment on the western Rift flanks, which recharges the Ndabibi Plains ((Clarke, 1990).).				

Sites with special significance for indigenous people and local communities - resulting from the Stakeholder Consultation:	According to the results from the LSC meeting, the stakeholders say that no such sites exist in the project area.
Where indigenous people and local communities are situated:	Even though traditional communities live in the project area, they are not considered, nor do they consider themselves, indigenous communities. The local communities are situated throughout the watershed.
Where indigenous people and local communities have legal rights, customary rights or sites with special cultural, ecological, economic, religious or spiritual significance:	N/A. The project will be carried out on private land, no such sites exist within the farmland. In addition, the stakeholders stated that no such sites exist inside the project area.
Evidence that Project Boundary is clearly distinguishable in the field:	The project boundary will be delimitated using GPS and generating a polygon for each of the areas included in the project. More information can be found in the farmer agreement.

SECTION A. Description of project

A.1. Purpose and general description of project

The Lake Naivasha Basin Reforestation Project has been funded as an insetting project by Coop Switzerland. The project intends to work with commercial flower growers and smallholding farmers located within the Lake Naivasha Basin to promote new tree planting activities, the rehabilitation of natural vegetation, productive reconversion and improved water resource management. The project will last for 30 years from 2018 to 2048. The planting will be conducted during the initial three years starting of the project, from 2018 to 2020. The reforestation target area is 1,000 hectares of individually owned farmland under both woodlots and agroforestry management systems.

The selection of planting areas is based on land availability, eligibility, consent and commitment of the individual landowners, land tenure system and the capacity of the local WRUAs and CFAs to continually monitor and submit data during the project lifetime. The community institutions, together with their members, will decide on the specific clusters, vet individuals and establish landownership systems where farmers are going to grow trees. This will make it easier for them to link with individual participating farmers and maintain records for the purpose of monitoring.

Planting will be done in two different management systems, woodlots and agroforestry, in the lower, middle and upper catchment areas. Individual farmers and selected institutions will enter into a mutual agreement with WWF-Kenya, specifying the rules of engagement, confirming participation and accepting terms of the Gold Standard.

For the purposes of planning activities for the Lake Naivasha Basin Reforestation Project the area is categorised into three catchment zones based on their elevation: lower, middle and upper. The key characteristics of each catchment zone are described in Table 2.

Table 2. Catchment zones in the Lake Naivasha Basin

Catchment zone	Elevation range	Description	Climatic considerations	WRUAs	CFAs	Population
Lower	Below 2,000 masl	The lower catchment zone is mostly located to the western side of Lake Naivasha.	This is a drought prone area with semi arid climate and annual precipitation less than 600 mm	Mariba	None	Relatively sparsely populated but mixed ethnicities
Middle	Between 2,000 masl and 2,500 masl	The middle catchment is mostly located in the hilly area east of Lake Naivasha (before rising to the upper catchment of the Aberdares Range)	There is a tropical humid climate with precipitation typically ranging between 800 to 1,200 mm per year. Some drought and limited frost risk.	Upper Malewa, Middle Malewa and Lower Malewa	None	Densely populated, predominantly smallholders of Kikuyu ethnicity
Upper	Above 2,500 masl	The upper catchment is mostly located towards the upper slopes of the Aberdares mountains on the eastern side of Lake Naivasha.	Cool climate with high frost risk. More than 1,200 mm of precipitation per year	Mkungi Kitiri, Upper Turahsa Kinji, Wajohi and Kianjogu	North Kinangop, Aberares Kiburu and Geta.	Predominantly smallholders of Kikuyu ethnicity

A precipitation map is shown in Figure 1. It illustrates the strong rainfall gradient increasing from the lower catchment in the west, which is very dry (semi arid), to the east, where annual rainfall levels increase with elevation (through the middle and upper catchment zones) as far as the Aberdares mountain range.

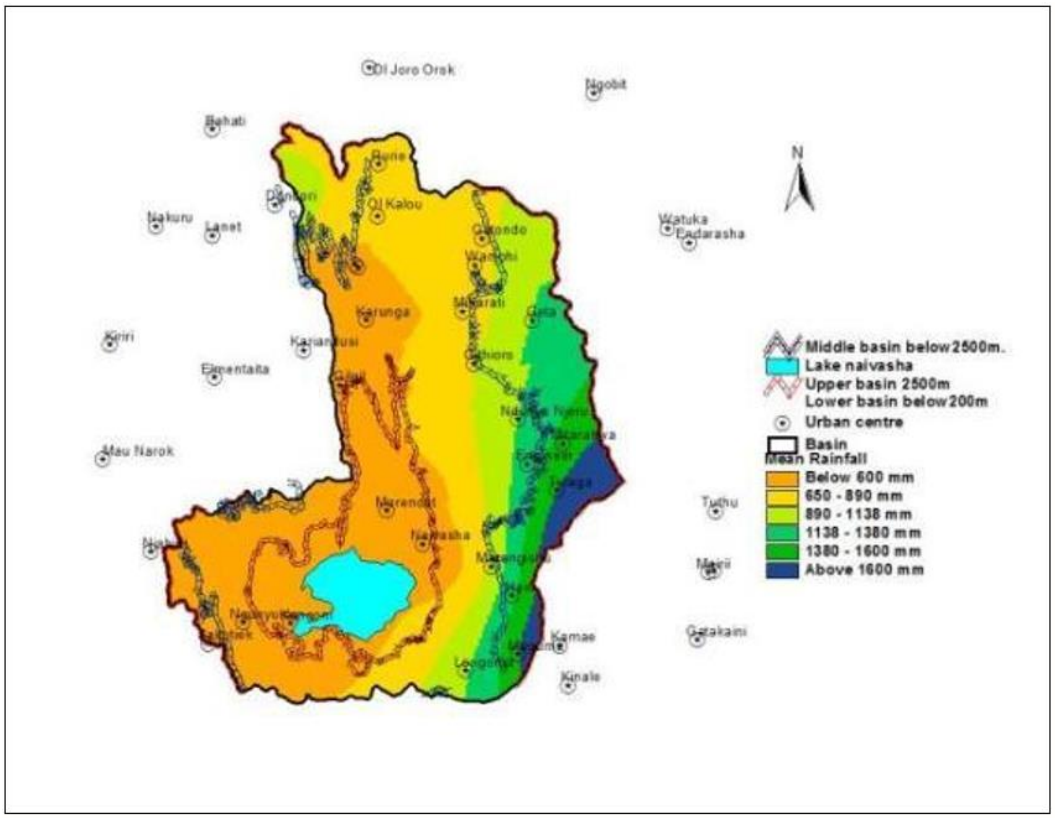

Figure 1. Lake Naivasha Basin Precipitation Map

Source WWF-Kenya

The land use that existed prior to the project's implementation consists of cropland, grassland and shrubland. The land cover types in the Lake Naivasha Basin are determined, to a large extent, by topography (see Figure 2). Table 3 provides a breakdown of land cover types for the Naivasha watershed in 2016. Lower elevation areas surrounding Lake Naivasha are predominantly shrubland with extensive built up areas (including Naivasha town). There is also perennial cropland, including many commercial horticultural and floricultural crop growers whose produces is sold to international markets. The middle elevation areas are mostly used for annual cropland by smallholding farmers whilst the higher elevations support permanent natural and planted forests. These forests exist mostly on the eastern part of the catchment area in the Aberdare Mountains. This area has the sources of many of the rivers that feed into Lake Naivasha for example the Malewa River, which provides up to 70% of Lake Naivasha's water. The project area will consist of small to medium landowners who will carry out the reforestation activities on land that was formerly cropland, grassland and shrubland.

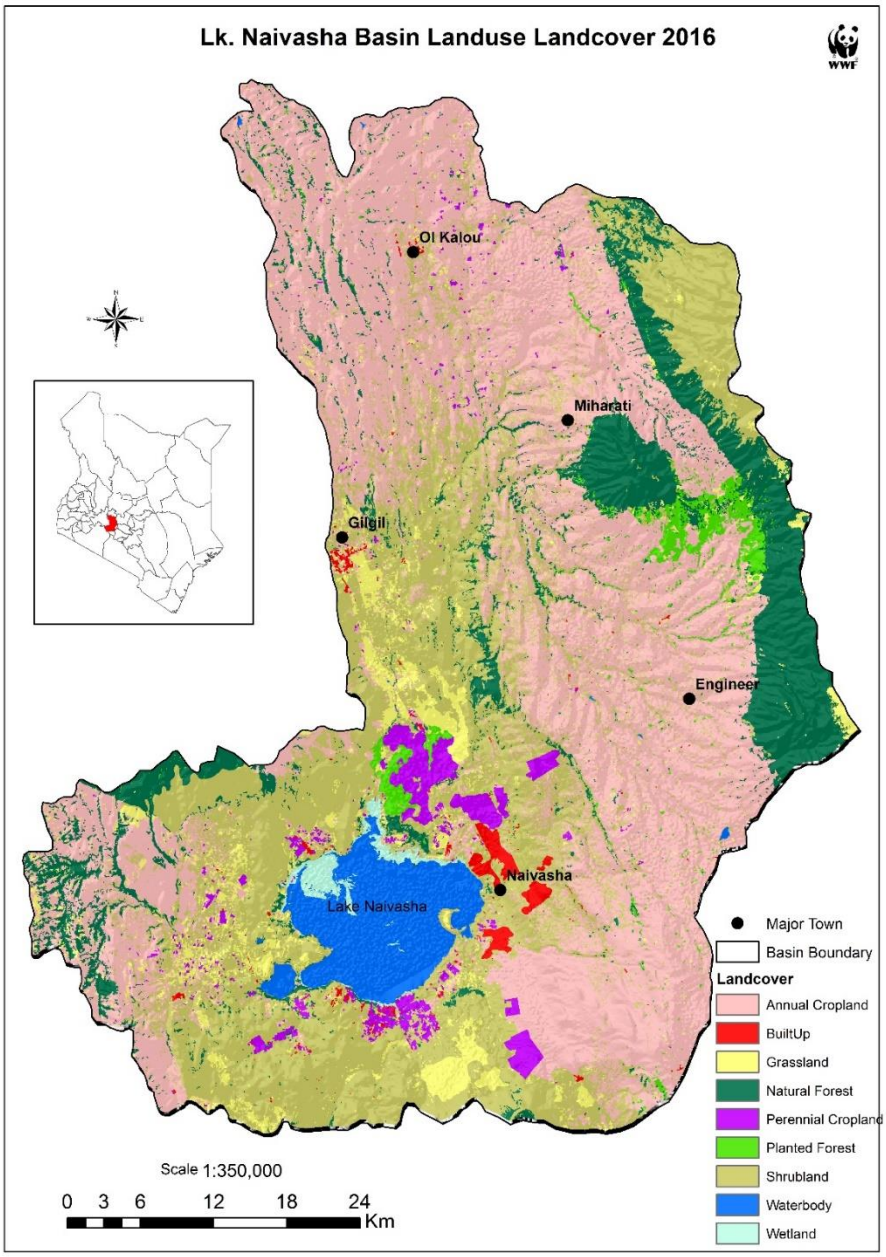

Figure 2. Lake Naivasha Basin Land Use and Cover 2016

Table 3. Land cover type by area in the Lake Naivasha Basin (2016)

Land cover type	2016 area (ha)	Cover % (2016)
Annual cropland	155,320	45.2
Built up	2,720	0.8
Grassland	15,865	4.6
Natural forest	36,324	10.6
Perennial cropland	7,629	2.2
Planted forest	6,127	1.8
Shrubland	103,299	30.1
Waterbody	13,953	4.1

Wetland	2,066	0.6
Total	343,303	100.0

Source WWF-Kenya (2016)

Project participants and roles

The project participants and their key roles in the project are described in Table 4.

Table 4. Project participants and roles in the Lake Naivasha Basin AR project

Project participant	Description of role
South Pole Group	• International anchor and link to international corporates • Manage fund dispersal • Provide technical support to forest establishment, management and monitoring; • Carbon certification • Guidance on issues relating to Gold Standard and insetting
WWF-Kenya	• Local implementation anchor • Co-ordinate implementation activities with WRUAs and CFAs • Local stakeholder consultation • Farmer selection • Mapping of project areas • Procure and deliver tree seedlings to participating farmers • Farmer training (on tree establishment and management) • Monitoring • Annual reporting • Implement rewards mechanism
Kenya Forest Service	• Design of forest management systems • Training of participating farmers in forest management
WRUA	• Implementation partners • Farmer selection • Monitoring
CFA	• Implementation partners • Farmer selection • Monitoring
Imarisha	• Key stakeholder to facilitate community engagement activities • Maintain platform with monitoring data
Oserian	• Water management and monitoring activities • Reforestation
Flamingo	• Water management and monitoring activities • Provision of seedlings

A.2. Eligibility of the project under Gold Standard

This project is eligible for Gold Standard Certification in accordance to the approved methodology: The Gold Standard A/R GHG emissions reduction & sequestration methodology [401.13 AR].

For GS an A/R project is eligible where trees are planted on land that does not meet the definition of a forest at the start of planting, and the planted area should not have been forest for at least 10 years prior to the start of planting. The eligibility analysis was performed based on cartographic information from the Global Forest Change 2000-2016 (Hansen et al., 2013).

Global Forest Change is a global loss and gain coverage forest map for the 2000 to 2016 period, constructed by Department of Geographic Sciences at the University of Maryland (USA). It was created using on Landsat TM, ETM +, and OLI images with a pixel size of 30 m and a cartographic scale of 1: 100,000. The results of the map are temporal series of Landsat images that characterize the forest cover and the change that has occurred according to the following definitions:

- Forest cover: Trees with a minimum height of 5 m, expressed as percentage of crown density per cell for the year 2000.

- Annual loss of forest cover: The loss of forest area per year, from 2000 to 2016.

- Data mask: Values that represent continental areas and permanent waterbodies.

To perform the eligibility analysis, Global Forest Change information was downloaded. This information is divided into 10 by 10 cells ranging from 180W-180E to 80N-60S. The project area is located between cells 0N and 30E. Three raster layers were downloaded; the forest cover layer at the pixel level (0% to 100% of cover) for the year 2000, the annual forest loss layer for the 2000 to 2016 period, and the layer of permanent water bodies in the study area referred to as the data mask.

To obtain the Forest-Non-Forest layers for 2007 and 2016 (Figure 3), the following steps were taken:

- Reclassification of the forest cover layer of 2000 according to FAO Forest definition (30% canopy cover).

- Reclassification of annual forest loss layer 2000 to 2016 to obtain layers of forest loss accumulated in 2007 and 2016.

- Subtraction of forest losses to 2007 and 2016 from the Forest-Non-Forest layer of the year 2000.

Using the Forest-Non-Forest layers (from 2007 and 2017), a cartographic crossover of both periods was made to delimit eligible areas. The information was reclassified defining eligible areas as those areas that were maintained as non-stable forest in the period 2007-2016. With exceptions for populated centres and permanent water bodies. A scale of 1: 100,000 was used. Non-eligible areas were defined as areas with stable forest or with gains or losses of forest cover over the same period.

Finally, using the resulting raster information, a post-processing was carried out. This consisted of changing the WGS84 geographic coordinate projection system to the flat WGS84-UTM 37S system. Then, transforming the resulting layer (raster) to vector format, eliminating isolated polygons smaller than 0.1 ha, constructing a table of attributes with categories: eligible (1) and non-eligible (0), and cutting the layer with the boundaries of the project area.

According to the initial eligibility analysis, 263,840 ha of the basin area were non-forest land for more than 10 years prior to the project start date and thus the area meets the eligibility criteria. The eligible area accounts for 77.6% of the total basin area. The non-eligible area makes up 79,471 ha. Figure 3 shows the eligible area, it is marked in orange. i.e. the land area that has been non-forest for more than 10 years prior to the project start date It is important to note that not all the eligible land is equally suitable for project implementation activities. Much of the area will be long established farmland, grassland, wetland and populated centres.

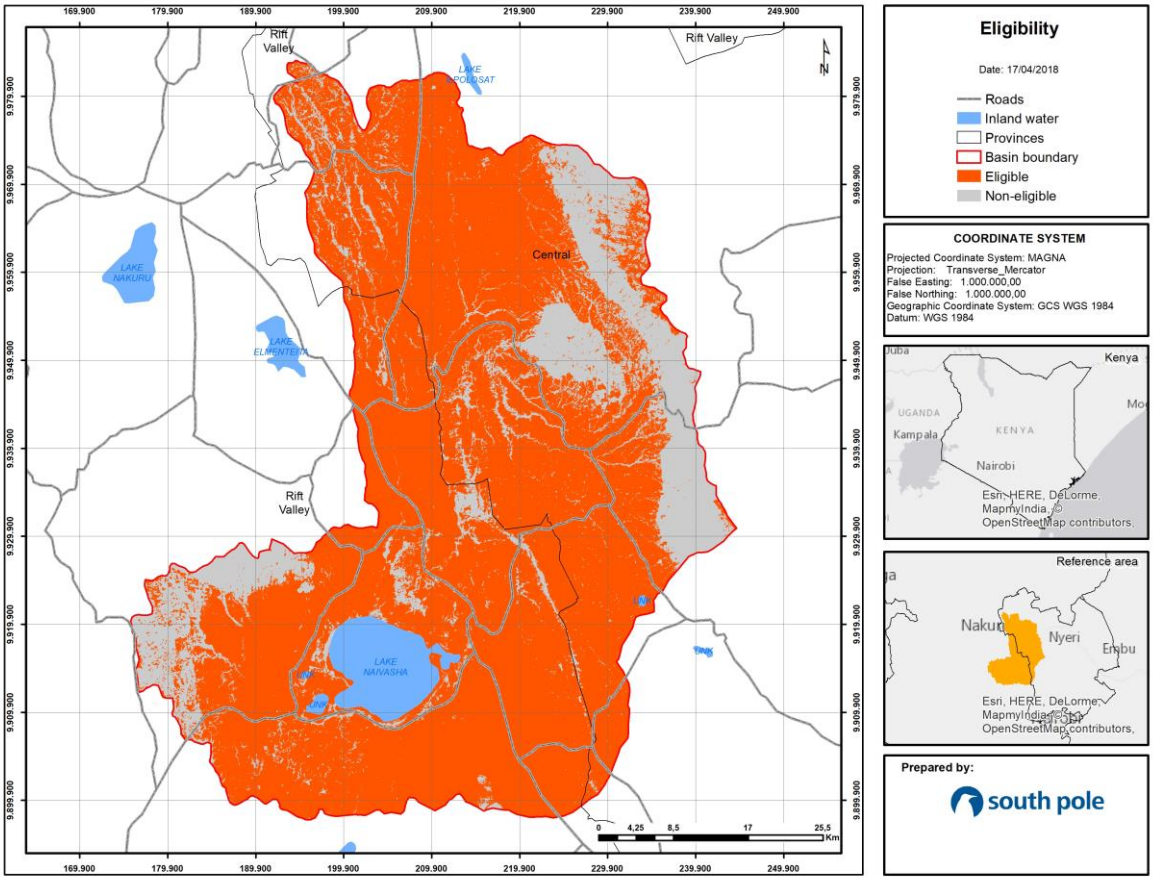

Figure 3. Eligibility map

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

The project is funded by Coop Switzerland. The landowners will sign an agreement that gives Coop Switzerland rights to the carbon sequestered until 42,000 tCO_2 emission reduction is reached. In order to ensure that all the landowners participating in the project are the true owners of the land, they are required to have at least a tittle deed or an allotment letter of the land. For more details of the contract, please refer to the landowner agreement in the folder Supporting documents; Agreements; Farmer Agreement.

A.4. Location of project

A.4.1. Host Country

Kenya

A.4.2. Region/State/Province etc.

Nakuru County

A.4.3. City/Town/Community etc.

Lake Naivasha Basin

A.4.4. Physical/Geographical location

The project is located in Nakuru County and includes the entire Lake Naivasha catchment area which is 3,433 km². The basin's altitude varies from 1,765 masl, the level of Lake Naivasha, rising to 3,982 masl at the top of the Aberdares mountain range. This is illustrated in the Lake Naivasha Topography map in Figure 4.

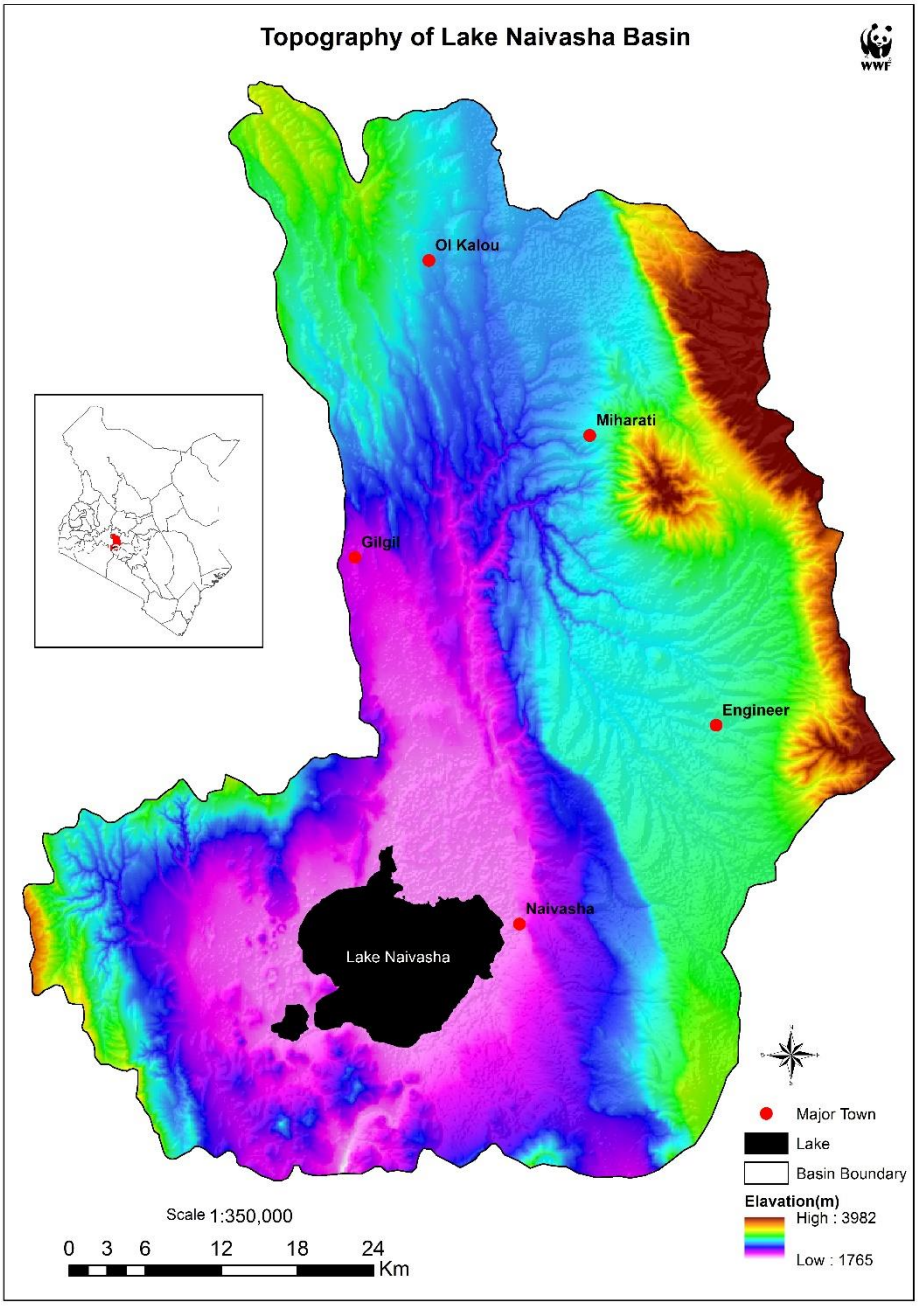

Figure 4. Lake Naivasha basin topography

A.5. Technologies and/or measures

The project intends to work with commercial flower growers and smallholding farmers located within the Lake Naivasha Basin to promote new tree planting activities, the rehabilitation of natural vegetation and improved water resource management. This will contribute to the following three SDGs: clean water and sanitation, climate action and life on land.

Farmers will be selected to implement reforestation activities through the WRUAs. Farmers must be selected through a fair and transparent process based on the principle of full, prior and informed consent (FPIC) achieved through the LSC process. The criteria for farmer selection may include: motivation of farmer and eligibility and hydrological benefits of the proposed reforestation site. Reforestation activities will be implemented by smallholders either through WRUAs or CFAs. All farmers should have a full understanding of the reforestation options that are available to them, the commitments required, the management operations required and the benefits that they will derive from the implementation of the reforestation. All participants should demonstrate that they hold an uncontested land title for the area where they intend to implement project activities. Participating farmers will enter into a signed agreement with WWF-Kenya to implement reforestation activities. The agreement will specify what WWF-Kenya will provide to the farmers (training, tree seedlings), the length of the agreement (minimum 30 years), the management system to be adopted by the farmer and the location of the activity.

The area is categorised into three catchment zones based on elevation: lower, middle and upper. All trees planted (reforestation) should remain in place for a minimum period of 30 years from the time of planting. During this period it is possible for farmers to perform silvicultural operations including pruning, thinning and even rotational harvest. However, all management operations (which includes both tree establishment and subsequent long term management) should be done following a management plan. In each of the three catchment zones (lower, middle and upper) participants will have a choice of two reforestation options: agroforestry or woodlots. The reforestation target is to establish 1,000 ha from 2018 to 2020. A summary of the proposed reforestation schedule is shown in Table 5.

Table 5. Reforestation (target) area per WRUA from 2018 to 2020

Catchment zone	WRUA	Agroforestry planted area (ha)	Woodlots planted area (ha)	Total planted area (ha)
Lower	Mariba (Kongoni)	35	35	70
Middle	Lower Gilgil	40	35	75
	Middle Malewa	75	50	125
Upper	Mkungi Kitiri	90	50	140
	Upper Turasha Kinja	80	58	138
	Wanjohi	50	30	80
	Upper Gilgil	75	25	100
	Upper Malewa	50	35	85
	Mariba (Oltoroto)	45	57	102
	Kianjogu	50	35	85
Total		**590**	**410**	**1,000**

Over the three year period the target is to establish 590 hectares of agroforestry and 410 hectares of woodlots. The current expectation is that approximately 210 ha will be planted in 2018, 540 ha in 2019 and 250 ha in 2020. The project implementation team will provide training to all participants to help them select the reforestation system most suited to their needs. They will then receive further training in all aspects of tree establishment and the subsequent management of their selected A/R system.

Agroforestry systems involve managing trees and food production systems together on the same area of land. The implementation of agroforestry systems should bring multiple benefits to farmers through improved crop production, the diversification of land use and income earning opportunities. Agroforestry systems are typically very popular with smallholders (farmers that have less than 2 ha of land) and who may otherwise be unable to plant trees due to a lack of available land. Agroforestry systems can also play a key role in soil conservation in hilly and erosion prone areas. Agroforestry will include planting widely spaced interspersed trees with crops. These trees will be planted with a distance of 6 m by 8 m between them resulting in 208 trees per hectare. Trees can also be planted more closely together (2 m apart) in lines along property boundaries and along terraces to create windbreaks and reduce soil erosion. In some cases, farmers may also plant more than one row or use some trees to create mini-woodlots. Assuming that an average of 884 m of boundary or terrace is planted per hectare (equivalent to 442 trees per hectare) the total number of trees planted per hectare by farmers adopting the agroforestry system is 650. Figure 5 illustrates the agroforestry planting design.

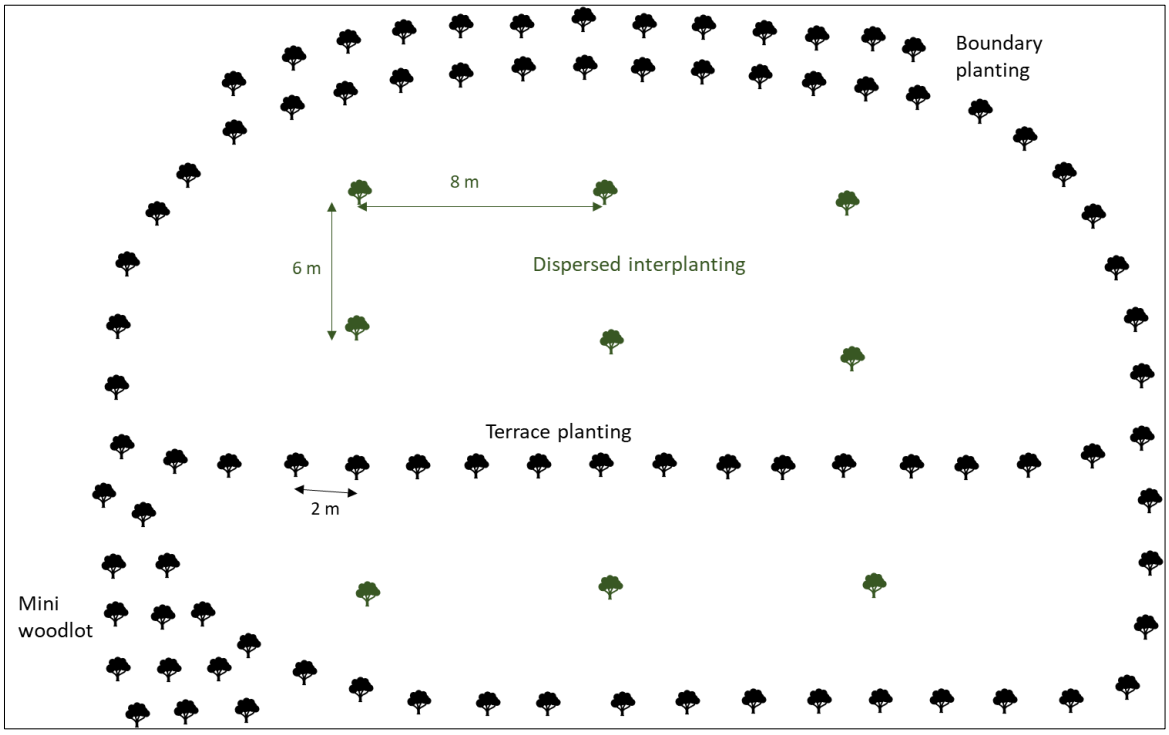

Figure 5. Illustration of agroforestry design

Table 6, Table 7 and Table 8 provide information on the key characteristics and management operations of each tree species used in agroforestry systems in the lower, middle and upper catchments zones of the Lake Naivasha Basin.

Table 6. Management operations for agroforestry reforestation in the lower catchment zone.

Tree species	Native / exotic	Growth habit	Proportion of planting (%)	Thinning	Rotation	Description of role

Casuarina equisitifolia	Exotic	Fast growing	30	Year 10 (25%) and 18 (25%)	25 years	Firewood, timber, fencing
Grevillea robusta	Exotic	Fast growing	20	Year 10 (25%) and 18 (25%)	25 years	Firewood, beekeeping, fodder and logs for timber.
Olea africana	Native	Slow growing	20	Year 40		Firewood, improved soil fertility (due to slow break down of leaf litter), timber and fencing as *Olea* has a very hard wood.
Prunus Africana	Native	Slow growing	20	Year 40		Firewood, improved soil fertility (due to slow break down of leaf litter), timber and fencing as *Prunus* has a very hard wood.
Mangifera indica	Exotic	Medium growing	10	None		Fruit

Table 7. Management operations for agroforestry reforestation in the middle catchment zone.

Tree species	Native / exotic	Growth habit	Proportion of planting (%)	Thinning	Rotation	Description of role
Casuarina equisitifolia	Exotic	Fast growing	30	Year 10 (25%) and 18 (25%)	25 years	Firewood, timber, fencing
Grevillea robusta	Exotic	Fast growing	30	Year 10 (25%) and 18 (25%)	25 years	Firewood, beekeeping, fodder and logs for timber.
Olea africana	Native	Slow growing	15	Year 40		Firewood, improved soil fertility (due to slow break down of leaf litter), timber and fencing as *Olea* has a very hard wood.
Prunus Africana	Native	Slow growing	15	Year 40		Firewood, improved soil fertility (due to slow break down of leaf litter), timber and fencing as *Prunus* has a very hard wood.
Persea americana	Exotic	Slow growing	10	None		Fruit

Table 8. Management operations for agroforestry reforestation in the upper catchment zone.

Tree species	Native / exotic	Growth habit	Proportion of planting (%)	Thinning	Rotation	Description of role
Casuarina equisitifolia	Exotic	Fast growing	5	Year 8 / 13 and 18	28 years	Firewood, timber, fencing
Dombeya goetzenii	Native	Medium growing tree	20			Beekeeping, soil conservation and improved soil fertility
Grevillea robusta	Exotic	Medium growing	10	Year 8 / 13 and 18	28 years	Firewood, beekeeping, fodder and logs for timber.
Hagenia abysinnica	Native	Fast growing up to 30 metres	30			Best for soil fertility, beekeeping (lots of flowers)
Olea africana	Native	Slow growing	15	Year 8 / 13 and 18		Firewood, improved soil fertility (due to slow break down of leaf litter), timber and fencing as *Olea* has a very hard wood.
Prunus Africana	Native	Slow growing	15	Year 8 / 13 and 18		Firewood, improved soil fertility (due to slow break down of leaf litter), timber and fencing as *Prunus* has a very hard wood.
Persea americana	Exotic	Slow growing	5	None		Fruit

Woodlot systems involve planting trees for permanent reforestation. The woodlot system may be used for the production of timber and non-timber forest products. The woodlot system is best adopted by farmers with more land availability (typically more than 2 ha). However, there are some landowners in the lower catchment zone with smaller farms who may wish to manage the entire landholding as a woodlot. To establish woodlots 1,100 trees per hectare are planted where the trees are spaced 3 m by 3 m apart. Except for *Acacia xanthophloea* trees which are planted in the lower catchment zone 4 m by 4 m apart. During the establishment phase, up to year three or four after planting, intercropping between the trees until canopy closure is encouraged. This is the most effective method of performing the management operations required for successful tree establishment. Weeding and the use of organic fertilisers, which are intended for the food crops, also benefit the young trees during this critical phase of their establishment.

Table 9, Table 10 and Table 11 provide information on the key characteristics and management operations required for woodlot systems in the lower, middle and upper catchment zones of the Lake Naivasha Basin.

Table 9. Management operations for woodlot reforestation in the lower catchment zone.

Tree species	Native / exotic	Growth habit	Proportion of planting (%)	Thinning	Rotation	Description of role
Acacia xanthophloea	Native	Fast growing (only in areas with raised water table)	30			Firewood, medicinal for treatment of malaria, charcoal, beekeeping
Casuarina equisitifolia	Exotic	Fast growing	20	Year 12 (25%) and 18 (25%)	28 years	Firewood, timber, fencing
Grevillea robusta	Exotic	Fast growing	40	Year 12 (25%) and 18 (25%)	28 years	Firewood, beekeeping, fodder and logs for timber.
Olea africana	Native	Slow growing	5			Firewood, improved soil fertility (due to slow break down of leaf litter), timber and fencing as *Olea* has a very hard wood.
Prunus africana	Native		5			Firewood, improved soil fertility (due to slow break down of leaf litter), timber and fencing as *Prunus* has a very hard wood.

Table 10. Management operations for woodlot reforestation in the middle catchment

Tree species	Native / exotic	Growth habit	Proportion of planting (%)	Thinning	Rotation	Description of role
Casuarina equisitifolia	Exotic	Fast growing	20	Year 12 (25%) and 18 (25%)	28 years	Firewood, timber, fencing
Cupressus lusistanica	Exotic		40	Year 6 (20%), 10 (20%) and 18 (20%)	28 years	Firewood, fencing, timber – furniture
Grevillea robusta	Exotic	Fast growing	15	Year 12 (25%) and 18 (25%)	28 years	Firewood, beekeeping, fodder and logs for timber.
Pinus patula	Exotic		10	Year 6 (25%) and 12 (25%)	28 years	Firewood, fencing, timber – construction
Prunus africana	Native		5			Firewood, improved soil fertility (due to slow break down of leaf litter), timber and

						fencing a *Prunus* has a very hard wood.
Olea africana	Native	Slow growing	5			Firewood, improved soil fertility (due to slow break down of leaf litter), timber and fencing as *Olea* has a very hard wood.
Juniperus communis	Native	Medium / slow – naturally matures in 100 years	5			Firewood, fencing,

Table 11. Management operations for woodlot reforestation in the upper catchment

Tree species	Native / exotic	Growth habit	Proportion of planting (%)	Thinning	Rotation	Description of role
Casuarina equisitifolia	Exotic	Fast growing	5	Year 12 (25%) and 18 (25%)	28 years	Firewood, timber, fencing
Cupressus lusistanica	Exotic	Fast growing	25	Year 6 (20%), 10 (20%) and 18 (20%)	28 years	Firewood, fencing, timber – furniture
Dombeya goetzenii	Native		10			Beekeeping, soil conservation and improved soil fertility
Ficus sycomorus	Native		5			
Grevillea robusta	Exotic	Fast growing	10	Year 12 (25%) and 18 (25%)	28 years	Firewood, beekeeping, fodder and logs for timber
Hagenia abysinnica	Native	Fastest growing up to 30 m	5			Best for soil fertility, beekeeping (lots of flowers)
Juniperus procera	Native	Medium / slow – naturally matures in 100 years	5			Firewood, fencing
Pinus patula	Exotic	Fast growing	20	Year 6 (20%), 12 (20%) and 18 (25%)	28 years	Firewood, fencing, timber – construction
Podocarpus gracilior	Native		10			
Olea africana	Native	Slow growing	5			Firewood, improved soil fertility (due to slow break down of leaf litter), timber and fencing since as *Olea* has a very hard wood.

No cultivation of food crops is permitted in riparian areas. Furthermore, woodlots in riparian zones must only have native tree species and no harvesting activities are permitted for the duration of the project (minimum of 30 years). A minimum of 10% of the project area will be identified and managed to protect or enhance the biological diversity of native ecosystems.

All participating farmers will be given full training on all aspects of both the establishment and long term management of their reforestation system. The training includes workshops, practical demonstrations and one to one guidance on land specific issues, which will be covered during site monitoring visits. The specific items that should be covered during the training are:

Establishment phase - before planting and up to year 3 after planting

1. Site preparation
2. Land demarcation
3. Handling of tree seedlings
4. Preparation of planting pits

5. Inter-cropping options and management of crops between trees
6. Tree planting design (which tree species go where)
7. Spacing between trees
8. Timing of planting to minimise risk of mortality
9. Tree seedling protection
10. Organic fertilization
11. Irrigation and watering
12. Weeding
13. Formative pruning
14. Replacement of dead trees

Management phase - years 4 to 7 after planting

1. Tree protection
2. On-going inter-cropping for agroforestry
3. Pruning
4. Thinning operations
5. Community monitoring

The monitoring system will be constructed with the community and is expected to increase capacity for project participants through supporting the monitoring of plantations, impact on water resources and impact on land use (in accordance with the indicators described below for each SDG).

A.6. Scale of the project

The project is small scale. The farmers selected will have more than 50% of farm work done by family members, cooperative members or neighbours.

A.7. Funding sources of project

The project will be initially funded by Coop Switzerland for 7 years or until 42,000 tCO_2 emission reductions is reached. It will then be sustained through the sale of carbon credits gained throughout the project lifetime.

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

The methodology selected for the calculation of GHG Sequestration is "Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology, Version 1 – Published in July 2017".

B.2. Applicability of methodology

1. Planting of trees on land that does not meet the definition of forest.

To comply with this condition, an eligibility analysis was performed for the planted area up to 2017 and the projected area to be planted.
For GS an A/R project is eligible where trees are planted on land that does not meet the definition of a forest at the start of planting. Nor should the planted area have been a forest in the 10 years prior to the start of

planting. The eligibility analysis was performed based on cartographic information from the Global Forest Change 2000-2016 (Hansen *et al.*, 2013[1]).

Global Forest Change is a global loss and gain coverage forest map for the 2000 to 2016 period, constructed by Department of Geographic Sciences at the University of Maryland (USA). It was performed based on Landsat TM, ETM +, and OLI images with a pixel size of 30 m and a cartographic scale of 1:100,000. The results of the map are temporal series of Landsat images that characterize the forest cover and the change that has occurred according to the following definitions:

- Forest cover: Trees with a minimum height of 5 m, expressed as a percentage of crown density per cell in the year 2000.
- The annual loss of forest cover: The loss of forest area per year, from 2000 to 2016.
- Data mask: Values represent continental areas and permanent waterbodies.

For additional information on planting trees on land that does not meet the definition of forest, refer to section A.2 of this document.

2. Project areas shall not be on wetlands

This category includes "land that is covered or saturated by water for all or part of the year (e.g. peatland) and that does not fall into the forest land, cropland, grassland or settlements categories" (IPCC, 2014).

The project area mainly consists of grassland and cropland. Only 0.6% of the catchment zone is wetland and will not be included in the project area.

3. Project areas with organic soils shall not be drained or irrigated (except for irrigation for planting)

The methodology defines organic soils as follows:

1. If the soil is never saturated with water for more than a few days and contains more than 20% organic carbon in terms of weight (35% organic matter).
2. If the soil is subject to water saturation episodes and has either:
   - 12% (by weight) organic carbon (20% organic matter) if it has no clay
   - 18% (by weight) organic carbon (30% organic matter) if it has more than 60% clay
   - A proportional lower limit of organic carbon content between 12 and 18% if the clay content of the mineral fraction is between 0 and 60%.

According with the definition, the soil types present in the project area are not organic and thus, this requirement is met.

In addition to this, soil disturbance will take place in less than 10% of the area that is submitted for certification. Given the information outlined in above, this requirement does not apply.

[1] Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. (2013). High-Resolution Global Maps of 21st-Century Forest Cover Change. Science, 342: 850–53. Available in: http://earthenginepartners.appspot.com/science-2013-global-forest.

B.3. Project boundary

>> *(Present a flow diagram of the project boundary, physically delineating the project, based on the description provided in section A.5 above.)*

For the purpose of GHG mitigation/sequestration following table shall be completed (delete if not required)

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Source 1: Aboveground biomass	CO_2	Yes	All grass and shrubs existing in the plantable area will be accounted for following the requirements for baseline carbon stocks estimation put forward by the methodology.
		CH_4	No	N/A
	Source 2: Belowground biomass	CO_2	Yes	Belowground biomass will be included in the baseline estimations in accordance with the applied methodology.
		CH_4	No	N/A
		N_2O	No	N/A
	Source 3: Soil	CO2	No	The project does not include disturbance of organic soils. Emissions are not expected in this compartment, however this source can be included in the future.
	Source 4: Other sources	N_2O	No	Using a conservative approach, it was assumed that the baseline scenario does not include the use of fertilizers. Emissions are not expected from this activity.
Project scenario	Source 1: Aboveground biomass	CO_2	Yes	During each cycle, trees will grow, sequester and stock carbon on their trunk, branches and leaves.
		CH_4	No	N/A
	Source 2: Belowground biomass	CO_2	Yes	While trees are growing there will be capturing and stocking carbon on their roots. Those roots will not be removed; as a result, the carbon will remain stored.
		CH_4	No	N/A
		N_2O	No	N/A
	Source 3: Soil	CO_2	No	Soil was not included, but this source might be included in the future.
	Source 4: Other sources	N_2O	No	No fertilization using nitrogenated sources will be used.

B.4. Establishment and description of baseline scenario

The baseline scenario was developed in accordance with the GS4GG Principles & Requirements. Please, refer to fold Supporting documents, Additionality document, section Step 1 for the full development of the baseline scenario.

B.5. Demonstration of additionality

For demonstration of additionality, please refer to fold Supporting documents, Additionality document.

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	**Combined tool to identify the baseline scenario and demonstrate additionality, Version 02.2**
Describe how the proposed project meets the criteria for deemed additionality.	The Lake Naivasha area is a prime area for agriculture development and urban expansion. This is due to a mix of availability of resources and foreign investment in the horticulture/floriculture business, which represents an extremely vigorous exportation market. The cut flower industry has seen its market value expanding 6 times its value from 1995 to 2014, being the biggest exporter country worldwide (Adeya, 2006). Also, the horticulture activities represent a good business opportunity, for small scale and industrial producers as well. The financial opportunities motivate the influx of people to the Lake Naivasha area, which is reflected in the vigorous urban expansion. The rising population exacerbates the need for agricultural land and livestock rearing in order to sustain the internal market. There is access to credit and funding and incentives to develop these activities. In the case of floriculture and horticulture, there is foreign investment and the market for these products is prominent, domestically but mostly internationally. These activities do not encounter any substantial barrier that impedes its continuous establishment. On the other hand, forestry activities seem to find several constraints. It finds strong competition from the other land uses, namely a higher opportunity cost, as the financial return is much longer. Furthermore, the market for forest products is not as developed as for the floriculture/horticulture products. This also makes these areas prone to encroachment or clearing, with the objective to establish other land uses. It also faces lack of investment or other types of financial incentives. It is virtually impossible to landowners establish forested areas without financial support. Finally, the strong demographic pressure in the area causes over use of the forestry resources, causing forest degradation and deforestation. These particularities represent real barriers to the development and thriving of this land use, putting the forest cover conservation and development at risk in this area. Please, refer to the Gold Standard for the Global Goals - Additionality Requirements for Afforestation/Reforestation Projects – Version 1 (July 2017) to see the full additionality analysis development.

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

SDG	Target
6 (Clean water and sanitation):	1. Percentage of watershed conservation (protection, restoration) in relation to the total project area and the baseline cover. 2. Sediment reduction in superficial flow where the project takes place.
13 (Climate action)	1. Improve education, awareness-raising and human and institutional capacity for climate change mitigation, adaptation, impact reduction and early warning. 2. Promote mechanisms for raising capacity for effective climate change-related planning and management in the least developed countries and small island developing states, including focusing on women, youth and local and marginalized communities
15. Life on land	1. By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. 2. By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.

B.6.2. Explanation of methodological choices/approaches for estimating the SDG outcome

All the SDGs will be monitored, however only the effects on SDG 13 will be estimated the using a methodology presented in the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions (Reduction & Sequestration Methodology). It is summarized below.

Calculation of CO_2 certificates

The number of CO_2-certificates is determined for every year (t) of the crediting period for each Modelling Unit using the following formula:

$$CO_2 certificates = \left(CO_{2-fixation} - Baseline - Leakage - Other\ Emissions\right) * Elegible\ planting\ area$$

Baseline and leakage are deducted in year 1, the other emissions are deducted over time. The baseline for the agroforestry system is zero because the farmers will establish the agroforestry systems in areas where they used to produce crops in the baseline and they will continue to growth those crops during the project crediting period.

The total CO_2 certificates for the project area are estimated as follow:

$$CO_{2-certificates\ Project\ area} = \sum_{MU=1}^{MUs} \sum_{t=1}^{CP} CO_2\ certificates\ MU,t$$

Where:

CO_2-certificates Project area, t = [tCO_2] CO_2-certificates of a project area in year t

CO_2-certificates MU,t = [tCO_2] CO_2-certificates of a MU in year t

MUs = 1, 2, 3, … MUs of a project area

t = 1, 2, 3, … Years of the crediting period

CP = [ ] Year the crediting period ends

The carbon pools taken into account are shown in Table 12.

Table 12. Carbon pools accounted for in the project

Carbon Pools		**Includes**	**CO_2-Fixation**	**Baseline**	**Leakage**
Tree biomass	Aboveground	Stem, branches, bark	Yes	Yes	Yes
	Belowground	Tree roots	Yes	Yes	Yes
	Aboveground	Grass, herbs, etc.	No	Yes	No

Carbon Pools		Includes	CO_2-Fixation	Baseline	Leakage
Non-tree biomass	Belowground	Roots of grass, herbs, etc.	No	Yes	No
Soil		Organic material	No[2]	No	No
Harvested wood (timber & energy wood)		Furniture, construction material, etc.	No	No	No
Litter & lying dead-wood		Leaves, small fallen branches, lying dead wood	No	No	No

- CO_2 fixation

Aboveground tree biomass was estimated with the following formulas:

$$CO_{2-fixation} = (Aboveground\ tree\ biomass + Belowground\ tree\ \ biomass) * CF * C\ to\ CO_2 factor$$

$$Aboveground\ tree\ biomass = Stem\ volume * BEF * W_d$$
$$Stem\ volume = MAI * t$$
$$Belowground\ tree\ \ biomass = aboveground\ tree\ biomass * (1 + R)$$

Where:
MAI= Mean Annual Increment in m³/ha
t= time in years
BEF= Biomass Expansion Factor (value specified in section B.6.3)
W_d= Wood density in (t/m³) (value specified in section B.6.3)
CF= Carbon Fraction (value specified in section B.6.3)
$C\ to\ CO_2\ factor$= value specified in section B.6.3
R=Root-to-shoot ratio (value specified in section B.6.3)

- Baseline: The eligible area was stratified according to the land cover (Table 13). As the areas that will be planted have not been identified yet, a conservative approach was used where a land use with high carbon stock is used for the ex ante estimations. This will be updated once the areas have been identified.

Table 13. Land cover type by area in the Lake Naivasha Basin (2016)

Land cover type	2016 area (ha)	Cover % (2016)
Annual cropland	155,320	45.2
Built up	2,720	0.8
Grassland	15,865	4.6
Natural forest	36,324	10.6
Perennial cropland	7,629	2.2
Planted forest	6,127	1.8
Shrubland	103,299	30.1

[2] Soil carbon was not included in this version, but might be included in the final version of the PDD for the Design Certification.

Waterbody	13,953	4.1
Wetland	2,066	0.6
Total	343,303	100.0

The equation used was:

$$Baseline_{stock} = Area_{stratum,i} * Carbon\ stock_{stratum,i}$$

- Leakage: Leakage is not expected to occur due to the project activities and is deemed to be zero. The main activities that could cause leakage are agriculture and livestock. The land where the plantations will be established was chosen with the landowner by identifying areas that were not previously productive. For livestock, the landowner will move the livestock to within the area and once the trees reach a certain height, livestock will be allowed in the plantation areas. Therefore, leakage will not occur in the project area.

- Other emissions: No emissions are generated by site preparation as no trees or bushes are being burned for site preparation. Other emissions could be generated by the use of nitrogen (N) fertilizers.

B.6.3. Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

Relevant SDG Indicator	tCO2 emission reduction
Data/parameter	Wood density
Unit	kg/m3
Description	Mass per unit volume of wood
Source of data	Global wood database. Chave J, Coomes DA, Jansen S, Lewis SL, Swenson NG, Zanne AE (2009) Towards a worldwide wood economics spectrum. Ecology Letters 12(4): 351-366. https://doi.org/10.1111/j.1461-0248.2009.01285.x. Available at: http://bit.ly/1LA74HB.
Value(s) applied	Depends on the species, more information is available in the ER estimation excel document.
Choice of data or Measurement methods and procedures	The data used was based on the literature consulted.
Purpose of data	Estimation of GHG Emission Reductions and Removals (SDG #13)
Additional comment	

Relevant SDG Indicator	Percentage of watershed conservation (protection, restoration) in relation to the total project area and the baseline cover. By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.
Data/parameter	Time series of land cover use
Unit	Hectares
Description	Hectares in conservation (protection and rehabilitation) compared with baseline cover.
Source of data	Lake Naivasha Basin Land Use and Cover 2016. WWF Kenya Figure 2.

Value(s) applied	
Choice of data or Measurement methods and procedures	The data used was based on primary and secondary information
Purpose of data	Estimation of conservation cover in watershed (SDG #6 y 15)
Additional comment	

Relevant SDG Indicator	Sediment reduction in superficial flow where the project takes place.
Data/parameter	Turbidity
Unit	Nephelometric Turbidity Units (NTU)
Description	Procedure for measurement of diffuse radiation, applicable to water of low turbidity (ISO 7027-1:2016 , 2016).
Source of data	Database WWF Kenya, in R. Wanjohi.
Value(s) applied	
Choice of data or Measurement methods and procedures	Primary information
Purpose of data	Estimation of turbidity (SDG #6)
Additional comment	

Relevant SDG Indicator	tCO_2 emission reduction
Data/parameter	Biomass Expansion Factor (BEF1)
Unit	Dimensionless
Description	Ratio of aboveground oven-dry biomass to the oven-dry biomass of the steam.
Source of data	Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Value(s) applied	1.1
Choice of data or Measurement methods and procedures	The aboveground tree biomass is calculated using the BEF1 in connection to Increment in Volume.
Purpose of data	Estimation of GHG Emission Reductions and Removals (SDG #13)
Additional comment	

Relevant SDG Indicator	tCO_2 emission reduction
Data/parameter	Root-Shoot-Ratio (R)
Unit	Dimensionless
Description	Ratio of the weight of the roots to the weight of the top of the tree. Used for belowground tree biomass estimation.
Source of data	Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Value(s) applied	0.2
Choice of data or Measurement methods and procedures	Belowground biomass is usually estimated as sampling is destructive and expensive.

Purpose of data	Estimation of GHG Emission Reductions and Removals (SDG #13)
Additional comment	

Relevant SDG Indicator	tCO_2 emission reduction
Data/parameter	tC/t d.m.
Unit	Percentage
Description	Percentage of the biomass of the tree that is carbon
Source of data	Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Value(s) applied	0.5
Choice of data or Measurement methods and procedures	Estimation of GHG Emission Reductions and Removals and Baseline emissions.
Purpose of data	Carbon Fraction (CF)
Additional comment	

Relevant SDG Indicator	tCO_2 emission reduction
Data/parameter	CO_2e
Unit	tCO_2/tC
Description	Factor applied to convert the tree carbon sequestered to tree CO_2e sequestered.
Source of data	Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Value(s) applied	44/12
Choice of data or Measurement methods and procedures	IPCC default value.
Purpose of data	Estimation of GHG Emission Reductions and Removals and Baseline emissions.
Additional comment	

Relevant SDG Indicator	tCO_2 emission reduction
Data/parameter	Plot area
Unit	m2
Description	Total area of the plots used for forest inventories.
Source of data	PDD document
Value(s) applied	250 m2 or 500 m2 (depending on the management system used)
Choice of data or Measurement methods and procedures	Circular plots of 250 m2 will be used for collecting data on woodlot systems. Rectangular plots of 500 m2 will be used for collecting data in agroforestry system.
Purpose of data	Estimation of GHG Emission Reductions and Removals and Baseline emissions.
Additional comment	Plot size might change if a new forest inventory procedure is established.

Relevant SDG Indicator	tCO2 emission reduction
Data/parameter	Sampling error
Unit	%
Description	This refers to the estimated sampling error in the forest inventory, estimated as presented in section B.7.2.
Source of data	Gold Standard AR methodology
Value(s) applied	20
Choice of data or Measurement methods and procedures	The values are established by the GS4GG
Purpose of data	Estimation of GHG Emission Reductions and Removals and Baseline emissions.
Additional comment	If the error is greater than the value applied, a deduction of CO2 certificates will be done according to the GS rules.

Relevant SDG Indicator	tCO2 emission reduction
Data/parameter	Carbon stock shrubland
Unit	tC/ha
Description	Average carbon stock of the land cover in the baseline scenario.
Source of data	Data from the literature. Please, refer to ER estimations excel sheet.
Value(s) applied	2.6
Choice of data or Measurement methods and procedures	The value is presented for the region and it is based on an extensive literature.
Purpose of data	Estimating baseline carbon emissions.
Additional comment	

B.6.4. Ex ante estimation of outcomes linked to each of the three SDGs

SDG 13 was the only SDG considered for monetization and consequent ex ante estimation. As such, CO_2 emission reduction was estimated for the forest plantations for both the agroforestry and woodlots management systems that will be used in the project.

Carbon estimations were developed following the AR methodology. The process is described briefly in section B.6.2. The detailed estimations are presented in the supporting folder ER estimations.

B.6.5. Summary of ex ante estimates of each SDG outcome

The outcomes corresponding to the SDG 13 are presented in Table 14. After estimating the long-term average according to the GS methodology, a total of 178,347 tCO_2 was estimated as the total carbon reduction generated by the project.

Table 14. SDG 13 Outcomes

Year	Baseline estimate (tCO_2)	Project estimate (tCO_2/year)	Net benefit[3] (tCO_2)
Year 1	-4,690	0	0
Year 2	0	5,037	4,281
Year 3	0	10,133	8,613
Year 4	0	10,133	8,613
Year 5	0	10,133	8,613
Year 6	0	10,029	8,524
Year 7	0	9,472	8,051
Year 8	0	8,611	7,320
Year 9	0	8,635	7,340
Year 10	0	8,069	6,859
Year 11	0	7,048	5,991
Year 12	0	6,599	5,609
Year 13	0	6,973	5,927
Year 14	0	7,890	6,707
Year 15	0	6,898	5,864
Year 16	0	6,753	5,740
Year 17	0	6,349	5,396
Year 18	0	6,235	5,300
Year 19	0	6,235	5,300
Year 20	0	6,235	5,300
Year 21	0	6,133	5,213
Year 22	0	6,337	5,387
Year 23	0	6,235	5,300
Year 24	0	6,235	5,300
Year 25	0	6,235	5,300
Year 26	0	6,235	5,300
Year 27	0	6,235	5,300
Year 28	0	6,235	5,300
Year 29	0	6,235	5,300
Year 30	0	6,235	5,300
Total	--	--	178,346

[3] For details about these estimations see the supporting folder ER estimations.

Year	Baseline estimate (tCO_2)	Project estimate (tCO_2/year)	Net benefit[3] (tCO_2)
Total number of crediting years	30		
Annual average over the crediting period			5,944

B.7. Monitoring plan

This monitoring plan provides guidance on monitoring and standard operational procedures for the reforestation project activity. This monitoring plan fulfils the requirement that the project activity should have credible and accurate monitoring procedures in place to enable the evaluation of project performance and verification of the net anthropogenic GHG emission removals.

During the monitoring process, the senior personnel overseeing the project activity will verify the data collected by field staff. The project will implement procedures that ensure independent verification. Attention will be paid to monitoring and measurement errors. This issue will be addressed through mandatory data checks and training of field personnel.

Only the aboveground biomass of trees and shrubs will be measured. Therefore, only the individual growth of trees will be monitored in the inventory plots.

The belowground carbon content and standing dead wood will also be assessed. These will be estimated by using default values and suggested methods as per Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology. Root-to-shoot ratio (R) will be used for estimation of belowground biomass given the aboveground measures.

In the case of water monitoring, the areas of direct influence of the project will be identified (where the planted areas will be implemented) and the monitoring points will be placed in the basin below these implementations, with the aim of recording and demonstrating the impact of these plantations on water resources. Flow, rain and turbidity will continue to be monitored.

B.7.1. Data and parameters to be monitored

Monitoring of SDG indicators:

SDG#6: Clean water and sanitation

Relevant SDG Indicator	Percentage of population using safely managed water services, urban/rural
Data / Parameter	Number of families
Unit	%
Description	Number of families that use safely managed water services, in urban and rural areas, divided by the total number of families participating in the project.
Source of data	Surveys and field visit
Value(s) applied	N/A
Measurement methods and procedures	The data will be collected during the field visit using a survey and visual verification.

Monitoring frequency	Annual
QA/QC procedures	
Purpose of data	To improve in water at a local level.
Additional comment	

Relevant SDG Indicator	Cover land use in conservation upstream of the catchment area (water resource management)
Data / Parameter	Ha in conservation land use
Unit	Hectares
Description	Identify the upstream of the catchment area and calculate the number of Ha used for conservation.
Source of data	Satellite imagery and registration during field visit
Value(s) applied	N/A
Measurement methods and procedures	Review the satellite imagery and estimate the number of hectares used for conservation upstream of the catchment area. Verify the land cover during the site visits.
Monitoring frequency	Annual
QA/QC procedures	
Purpose of data	Identify the trend of conservation coverage.
Additional comment	

Relevant SDG Indicator	Percentage of watershed conservation (protection, restoration) in relation to the total project area and the baseline cover. By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.
Data/parameter	Time series of land cover use
Unit	Hectares
Description	Hectares in conservation (protection and rehabilitation) compared with baseline cover.
Source of data	Lake Naivasha Basin Land Use and Cover 2016. WWF Kenya Figure 2.
Value(s) applied	
Choice of data or Measurement methods and procedures	The data used was based on primary and secondary information
Purpose of data	Estimation of conservation cover in watershed (SDG #6 y 15)
Additional comment	

Relevant SDG Indicator	Sediment reduction in superficial flow where the project takes place.
Data/parameter	Turbidity
Unit	Nephelometric Turbidity Units (NTU)

Description	Procedure for measurement of diffuse radiation, applicable to water of low turbidity (ISO 7027-1:2016 , 2016).
Source of data	Database WWF Kenia, in R. Wanjohi.
Value(s) applied	
Choice of data or Measurement methods and procedures	Primary information
Purpose of data	Estimation of turbidity (SDG #6)
Additional comment	

SDG#13: Climate action

Relevant SDG Indicator	Number of people form the local community attending awareness sessions on the environment and climate change
Data / Parameter	Number of people attending the meetings
Unit	Number
Description	Number of people from the local community attending awareness sessions on the environment and climate change.
Source of data	WWF-Kenya
Value(s) applied	To be determined in the first year after validation.
Measurement methods and procedures	Number of people from the local community attending awareness sessions
Monitoring frequency	Annually
QA/QC procedures	See section B.7.3. Other elements of the monitoring plan, QA/QC procedures
Purpose of data	To record the number of people attending these sessions.
Additional comment	

Relevant SDG Indicator	Basal area
Data / Parameter	Basal area (π (DBH/2)2)
Unit	m^2/ha
Description	The sum of the basal area of all live trees in a forest stand. The basal area of a tree is the cross-sectional area of its trunk measured at 1.3 m height, over the bark.
Source of data	WWF-Kenya
Value(s) applied	Dependent on the age of the stand and the date of the inventory.
Measurement methods and procedures	This value depends on the DBH.
Monitoring frequency	At least once every 5 years
QA/QC procedures	See section B.7.3. Other elements of the monitoring plan, QA/QC procedures
Purpose of data	To use this information on the carbon estimations.
Additional comment	

Relevant SDG Indicator	Volume per hectare

Data / Parameter	Volume
Unit	m^3/ha
Description	Volume of wood
Source of data	Forest inventory
Value(s) applied	Depend on the age of the stand and the date of the inventory.
Measurement methods and procedures	The measurement method is presented in the section Monitoring Plan below.
Monitoring frequency	At least once at every 5 years
QA/QC procedures	See section B.7.3. Other elements of the monitoring plan, QA/QC procedures
Purpose of data	To estimate the carbon emission reduction at each performance certification
Additional comment	

Relevant Indicator	Diameter at breast height (DBH)
Data/parameter	DBH
Unit	cm or m
Description	The DBH of a tree is the diameter of its trunk measured at 1.3 m height, over the bark.
Source of data	Forest inventory
Value(s) applied	NA
Measurement methods and procedures	The DBH will be measured using a measuring tape in each forest inventory plot
Monitoring frequency	For every Performance Certification
QA/QC procedures	See section B.7.3. Other elements of the monitoring plan, QA/QC procedures
Purpose of data	To use the information for carbon estimations.
Additional comment	

Relevant Indicator	Tons of CO_2 captured per period
Data/parameter	Tons of CO_2 captured per period
Unit	tCO_2/period
Description	Quantity of CO_2 captured per period. Each period corresponds to the number of years between Performance Certifications.
Source of data	Forest inventory and literature
Value(s) applied	To be determined at each Performance Certification.
Measurement methods and procedures	This calculation will be performed taking into account the GS Afforestation/afforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Monitoring frequency	To be determined at each Performance Certification.
QA/QC procedures	See section B.7.3. Other elements of the monitoring plan, QA/QC procedures
Purpose of data	To assess the emission reduction potential of the project by capturing carbon through the establishment of forest plantations.

Additional comment	

SDG#15: Life on Land

Relevant SDG Indicator	Forest area as a proportion of total land
Data / Parameter	Planted area
Unit	Percentage
Description	Planted area per year
Source of data	Satellite imagery and registration of implemented forest areas with the project activities.
Value(s) applied	To be determined annually.
Measurement methods and procedures	Annually records of the planted area will be consulted. GIS information could also be consulted.
Monitoring frequency	Annually
QA/QC procedures	
Purpose of data	To monitor the expansion of the plantation and to estimate GHG emission reductions and removals.
Additional comment	

B.7.2. Sampling plan

The data sampling will be designed according to strata defined for the project according to the planting date and to the different forest stand models. Therefore, the sample plots will be established in each stratum (Table 15).

Table 15. Modelling units

MU	*Planting Year*	*Catchment zone*	*Management System*	*Potential planted area (ha)*
1	2018	Lower	Woodlot	7
2			Agroforestry	7
3		Middle	Woodlot	18
4			Agroforestry	24
5		Upper	Woodlot	61
6			Agroforestry	92
7	2019	Lower	Woodlot	19
8			Agroforestry	19
9		Middle	Woodlot	46
10			Agroforestry	62
11		Upper	Woodlot	157
12			Agroforestry	238
13	2020	Lower	Woodlot	9
14			Agroforestry	9
15		Middle	Woodlot	21
16			Agroforestry	29
17		Upper	Woodlot	73
18			Agroforestry	110
Total				***1000***

The strata will be monitored in order to identify different growth patterns inside each stratum that can lead to unification between strata or a most detailed stratification. An annual update of the project area is suggested given the gradual process of intervention, this allows for permanent control and monitoring of the area. The areas will be periodically monitored using the monitoring criteria established for the project boundaries. The process seeks to identify if the stratum defined ex ante need to be changed. According to changes in the accumulation of carbon during each monitoring period, a new stratification that groups based on biomass growth can be created. The findings from each monitoring period will allow a restratification for the next one, within the following parameters:

- Age
- Silviculture management
- Carbon capture
- Cost-effectiveness of the monitoring process
- Disturbances (plagues, fire, pathologies, etc.)

Plot type and size

Temporal plots will be used for sampling carbon stock in all the areas. The sample plots will be used to take measurements such as diameter at breast height (DBH) as well as list species type. For all trees, the DBH measurement will be taken at a height of 1.3 m. For woodlots, circular temporal plots of 250 m^2 will be used for collecting data. For agroforestry, rectangular temporal plots of 20 m by 25 m will be measured before each Performance Certification, and recorded and kept in a plot file. Temporal plots will be geo-referenced.

Number of sample plots

The number of sample plots for the forest inventory will meet a MU precision with minimum errors of +/- 20% with a 90% confidence level. To do so, a sampling error will be estimated using the following equation[4]:

[4] Pearson, T., Walker, S., & Brown, S. (2005). Sourcebook for land use, land-use change and forestry projects. Winrock International and the BioCarbon Fund of the World Bank, 57.

$$E^2 = \left[\frac{\left(\sum_{h=1}^{L} N_h * S_h\right)^2}{n} - \left(\sum_{h=1}^{L} N_h * S_h^2\right)\right] * \frac{t^2}{N^2}$$

Where:
E = allowable error. Calculated by multiplying the mean carbon stock by the desired precision (0.2 as per Gold Standard rules)
T = the sample statistic from the t-distribution for the 90% confidence level.
Nh = Number of sampling units for stratum h (=area of stratum in hectares or area of the plot in hectares)
N = Number of sampling units in the population
Sh = Standard deviation of stratum h.

Where the error is above 20%, the additional difference shall be deducted as per GS AR Methodology.

Standard operating procedure

The plots will be systematically located with a random start in each stratum to avoid the subjective choice of plot locations and interventions such as moving plot centres and plot reference points to more "convenient" positions. In order to do this, Geographical Information Systems (GIS) tools will be used so that the centre of the plot can be easily identified on a map for each stratum. The systematic location of plots within each stratum will be achieved by overlaying a grid on the project map and allocating plots in a regular pattern across the strata. The plot locations will be identified with the help of the Global Positioning System (GPS) device in the field. For each plot the geographic position (GPS coordinates), administrative location and stratum code will be recorded and archived. The plots will be established before any monitoring takes place. In the case of exceptional circumstances in temporal plots (such as forest fires or uneven growth), additional plots may be laid out. In addition, a Standard Operation Procedure (SOP) will be used to make sure the measurements are consistent throughout different teams.

i) Access to plots

The plots will be located using cartography tools. Some reference points that facilitate orientation in the field will also be identified on the maps. The local members of the field crew will help to access the plots easily. Orientation in the field will be facilitated by using GPS where the central points of each plot have been registered as waypoints. To ensure the use of the exact same point, an average position is taken with the GPS. When the GPS reading indicates that the point is within a few meters (closer than 10 m distance). Then, the compass and measuring tape might be used for the last few meters instead of the GPS. The order of the plots for data collection, decided during the preparatory phase, should be followed and the plot code and orientation must be respected.
While accessing each plot, a field sheet must be filled in. The coordinates of the departure location on foot towards the first plot must be read on GPS (or on the map, if the GPS does not have a signal). The coordinates of each reference point are read on the GPS and reference photographs will be taken. The unique photograph codes will be reported in the field sheet.

ii) Establishment of temporal plots

When arriving at the point selected based on GIS methods for the location of the plot, a temporary marker, such as a wooden stake, is positioned. The marker must be positioned exactly at the point indicated by the GIS analysis. This is the centre of the plot. In cases where obstacles obstruct the exact location (such as the presence of trees, rocks, rivers, etc.) the marker will be positioned as close as possible to the GIS point selected as the plot location. The location marker data must be collected together with a description of the plot.
The coordinates of plot marker positions are determined using GPS, as an average position. An identification number (ID) will be assigned to each of the points recorded by the GPS. The distance and direction (measured using a compass bearing in degrees, 360°) of the temporary marker from the actual location marker must be measured. This is done in case the two positions do not coincide. This information is recorded in the form under observations.

iii) Data collection in the field

The data collection begins at the plot starting point and continues in a predefined direction. From the plot centre, the northern bearing will be identified (0°). From there the trees will be measured in a clockwise direction.

Tree measurements

The DBH of all trees over 5 cm will be measured, and these data will be recorded in a field sheet section "Recording the data". Trees located on the border of the plot will be considered as being inside the plot if at least half of the stem diameter at breast height is with the limit of the plot. Data collected include records of plant species that have been identified (common and scientific name) and diameter. Tree diameter measurement methods are crucial for the accurate reporting of data.

Tree DBH measurement

Tree diameter is measured over bark at breast height, which is 1.3 m above the ground, except in the cases mentioned below. The measurement can be carried out with a diameter tape or with the use of a caliper (as shown in Figure 6 below).

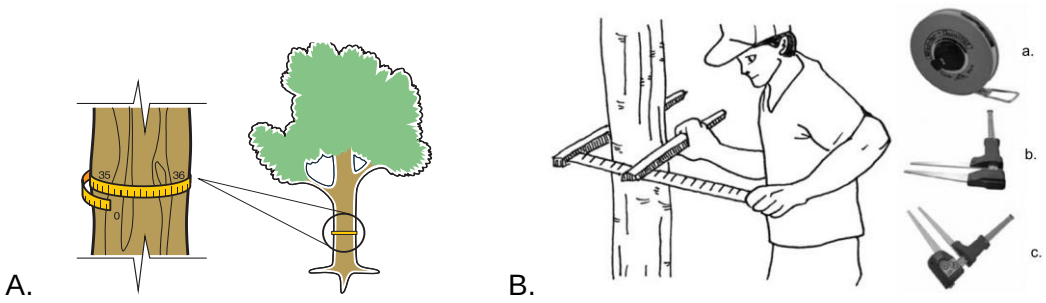

Figure 6. Illustration of diameter measurement methods (A. diameter tap, B. manual clipper) and possible measurement devices: a. diameter tap, b. and c. manual and digital callipers (Source: (Yepes et al., 2011)

Some precautionary measures must be taken into account (Figure 7. Correct ways for diameter measurement at breast height (Source: Lema, 2003)Figure 7):

- Measurement instruments are to be used in such a way that they perpendicularly cut the tree axis at 1.3 m.
- If diametric tape is used, ensure it is not twisted and is well positioned around the tree, perpendicular to the stem. Nothing must prevent direct contact between the tape and the bark of the tree being measured.
- On inclined terrain, DBH tree measurement at 1.3 m is taken from the highest part of terrain.
- For forked trees (where the stem or trunk divides), measuring varies depending on to the point at which the stem forks. If the fork begins below 1.3 m height, each stem diameter will be considered as a tree and will be measured. Diameter measurement of each stem will be taken at 1.3 m height. If the fork begins at 1.3 m or higher, the tree will be counted as a single tree. The diameter measurement is thus carried out below the crotch intersection point, just below the bulge that could influence the DBH.
- Trees with an irregular stem at 1.3 m (such as bulges, wound, hollows, branches, etc.), are to be measured just above the irregular point, there where the irregular shape does not affect the stem.

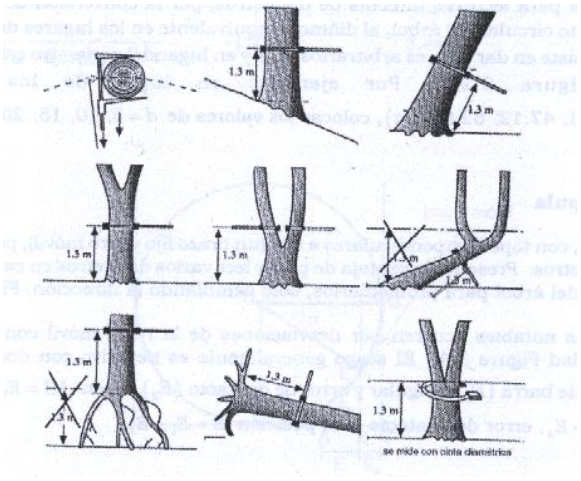

Figure 7. Correct ways for diameter measurement at breast height (Source: Lema, 2003)

Recording the data

The field data collected will be done using ODK to keep records of all data collected. Community members will be identify and trained to perform the data collection using the ODK.

The data collected, calculations and related outputs will be recorded and backup copies will be made. The variations observed by the field staff are monitored again, thus becoming the subject of new processing and reporting activities.

Monitoring intervals and frequency

According to the GS rules, the project will be monitored at least once every 5 years.

Analysis of the monitored data and parameters

The data recorded in the forest inventory (DBH) will be the input used for the growth models that will define the total biomass accumulated for the project at the time of monitoring.

The ex post estimates, default parameters and equations, will be the same as those used for the ex ante. Unless better values exist at the time of verification, they must always comply with the requirements. The conservative default approach may be selected.

In the case of SDG 6 and 15, the monitoring system will be defined once the plots of land associated with the project are defined, establishing correlations between the project activities and the water flows and coverage in the corresponding basin. The monitoring will be carried out at least twice a year, in the rainy season and the dry season, and will be linked to the WRUAs and the community.

B.7.3. Other elements of monitoring plan

Procedures for internal auditing and QA/QC

QA/QC procedures will be implemented to ensure that net GHG removals are measured and monitored precisely, credibly, verifiably, and transparently. The project will follow the IPCC GPG method, using two types of procedures, to ensure that the inventory estimates and their contributing data are high quality. As a QA/QC plan is fundamental to create credibility, an appropriate plan will be developed that outlines

QA/QC activities. It will include time frames and outline steps from preparation to final reporting. The plan will describe specific QC procedures in addition to special QA review procedures. The QA/QC plan is an internal document used to organize, plan, and implement QA/QC activities and will be demonstrated here only in as a summary. Below are abstracts from the QA/QC plan:

- Standard Operating Procedures (SOP) will be established for all procedures such as GIS analysis, field measurements, data entry, data documentation and data storage.

- Training courses will be held for all relevant personnel on all data collection and analysis procedures.

- Steps will be taken to control errors in sampling and data analysis. This is done in order to develop a credible plan for measuring and monitoring carbon stock change in the project context. The same procedures will be used throughout the project life to ensure continuity.

The personnel involved in the measurement of carbon pools will be fully trained in field data collection and analysis. SOPs will be developed for each step of the field measurements and followed so that measurements are comparable over time. If different interpretations of the SOPs exist among the field teams, they will be jointly revised to ensure clear cohesive guidance. This procedure will be repeated during the field data collection stage.
To verify that plots have been installed and the measurements are taken correctly, a 10% minimum of randomly selected plots will be remeasured by a supervisor and a team that was not involved in the initial measurement sampling.
The remeasurement data will be compared with the original measurement data. Any errors found will be corrected and recorded. The level of errors recorded will be calculated and reported using the following equation:

$$Error\ (\%) = \frac{Estimate1 - Estimate2}{Estimate2} * 100$$

The proper entry of data into the data analyses spreadsheets is required to produce reliable carbon estimates. All data sheets will include a "Data recorded by" field. Communication between all personnel involved in measuring and analysing data will be used to resolve any apparent anomalies before final analysis of the monitoring data can be completed. If there are any problems with the monitoring plot data that cannot be resolved, the plot will not be used in the analysis. Expert judgment and comparison with independent data will be used to ensure data results are in line with expectations. Additionally, field data will be reviewed by the leader of the monitoring team, further ensuring that the data and analysis are accurate.
Due to the long length of the project and the speed at which technology changes, raw data archiving is essential. Data will be archived in several forms and copies of all data will be provided to each project participant. Original copies of the field measurements (data sheets and electronic files) will be stored in a secure location. Copies of all data analysis and models, the final estimate for the carbon sequestered, any GIS products and the measuring and monitoring reports, will be stored in a dedicated safe place (preferably offsite). Electronic copies of all data and reports will be updated periodically and converted to any new format required by future software or hardware. An employee involved in the field measurements will be tasked with implementing this update. The data collected shall be archived for a period of at least two years after the end of the last crediting period of the project activity. The main activities to be developed for the QA/QC process are described in the Table 16.

Table 16. Verification and checklist used to guarantee the quality of information gathered and its management.

QC activity	Procedures
Check that assumptions and criteria for the selection of activity data, emission factors and other estimation parameters are documented.	Crosscheck descriptions of activity data, emission factors and other estimation parameters with information on source and sink categories and ensure that these are properly recorded and archived.
Check for transcription errors in data input and reference.	Confirm that bibliographical data references are properly cited in the internal documentation. Crosscheck a sample of input data from each source category (either measurements or parameters used in calculations) for transcription errors.
Check that emissions and removals are calculated correctly.	Reproduce a representative sample of emission or removal calculations. Selectively mimic complex model calculations with abbreviated calculations to judge relative accuracy.
Check that parameter and units are correctly recorded and that appropriate conversion factors are used.	At each design certification check that: - Units are properly labelled in calculation sheets and are correctly carried through from beginning to end of calculations. - Conversion factors are correct. - Temporal and spatial adjustment factors are used correctly.
Check the integrity of database files.	At each field data collection: - Confirm that the appropriate data processing steps are correctly used in the database. - Confirm that data relationships are correctly represented in the database. - Ensure that data fields are properly labelled and have the correct design specifications. - Ensure that adequate documentation of database, model structure and operation are archived.
Check for consistency in data between categories.	Identify parameters, such as activity data and constants, that occur in multiple categories of sources and sinks, and confirm that the values used for these parameters are consistent in the emissions calculations.
Check that the movement of inventory data among processing steps is correct	At each design certification check that: - Emission and removal data are correctly aggregated through lower reporting levels to higher ones, when preparing summaries. - Emission and removal data are correctly transcribed between different intermediate products.
Check that uncertainties in emissions and removals are estimated or calculated correctly.	At each design certification check: - That the individuals providing expert judgment for uncertainty estimates are suitably qualified. - Qualifications, assumptions and expert judgments are recorded. Check that calculated uncertainties are complete and calculated correctly.
Undertake review of internal documentation	At each field data collection check that: - There is detailed internal documentation to support the estimates and to enable reproduction of the emission, removal and uncertainty estimates. - Inventory data, supporting data and inventory records are archived and stored to facilitate detailed review.
Check time series consistency.	At each field data collection check that:

QC activity	Procedures
	- Check for temporal consistency in time series input data for each category of sources and sinks. - Check for consistency in the algorithm and method used for calculations throughout the time series.
Undertake completeness checks	At each design certification: - Confirm that estimates are reported for all categories of sources and sinks and for all years. - Check that known data gaps that may result in incomplete emissions estimates are documented and treated conservatively.
Compare estimates to previous estimates.	For each category, where available, current inventory estimates should be compared to previous estimates. If there are significant changes or departures from expected trends, recheck estimates and explain the difference.

Uncertainty assessment

The project follows methods from IPCC GPG for LULUCF (GPG 2003) and procedures for A/R project activities to estimate baseline net GHG removal. This covers removals by sinks, leakage, actual net GHG removal by sinks and net anthropogenic removal by sinks. In the context of this methodology, the major sources of uncertainties are related to changes in carbon stock in the living biomass pool. They include natural factors such as fire and pest outbreaks, stand variables such as variation in the yield tables, allometric equation, biomass expansion factor (BEF), wood density, carbon fraction and the errors in measurement. Uncertainty estimates will be developed for all land-use categories in the inventory part of the monitoring.

Verification of project emissions

The project will quantify and monitor the non-CO_2 GHG emissions resulting from (forest) fire within the project boundary. The accumulated area affected by such fires in a year is less than 5% of the project area. These events will be monitored and the affected area will be recorded.

Emission of non-CO_2 GHGs resulting from the loss of aboveground tree biomass due to fire will be calculated in each verification period. The aboveground biomass of trees belonging to relevant strata, calculated in the previous verification, and the default values for the combustion factor, the emission, will be used.

SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

The start date of the project is defined as the initial planting date.

C.1.2. Expected operational lifetime of project

The expected operational lifetime is 30 years.

C.2. Crediting period of project

C.2.1. Start date of crediting period

April 2018.

C.2.2. Total length of crediting period

The total length of crediting period is 30 years.

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/ potentially/no)	Justification	Mitigation measure (if required)
SOCIAL & ECONOMIC SAFEGUARDING PRINCIPLES				
Principle 1 - Human Rights	1. Does the Project respect human rights?	Yes	The WWF social and policies principles consider respect for human rights in accordance with customary, national and international human rights laws. WWF recognizes human rights as central to achieving effective and equitable conservation and development outcomes.	
	2. Does the project discriminate with regards to participation and inclusion?	No	The WWF social politics and principles prove its ongoing commitment to equity, integrating a gender perspective in its projects with not discrimination.	
Principle 2 - Gender Equality and Women's Rights	1. Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?	Potentially	The project is designed to benefit households – including both genders through sustainable Natural Resource Management. However, this might arise when the husband, who in most cases the custodian/ owner of the farm, might decide to have the piece of land dedicated for crop production for planting of trees for the project, leaving the woman with no place for planting crops or denying her access to the benefits of the project.	Both the husband and wife should come to a consensus on where to plant the trees for the project.
	2. Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable	Potentially	Youths and women are isolated in some area especially in land ownership. However, there are some isolated cases,	There will be inclusion of all the family

	communities (e.g., potential increased burden on women or social isolation of men)?		especially where there are no men in the family, where women have full ownership of the land.	members in the implementation of the project.
	3. Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?	No	Women are very active members of community. Note 70% of labour comes from women. In addition, WWF has a strong presence in the project area with vast experience on the differences between the roles between genders.	
	4. Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?	Yes	The project provides an opportunity for people to engage in open discussions on matters regarding gender and agree on the most appropriate conditions for everyone. Since we have been working together, the locals here understand that WWF policies takes into account gender roles and the abilities of both men and women to benefit from its projects. The Lake Naivasha Basin Reforestation project is not an exemption. Again, they will all benefit from the trees that they will be planting. The invitation for the meeting and participation of the stakeholders in the meeting guaranteed the inclusion of both genders.	
	5. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?	Potentially	Tree planting is not labour intensive. They are not being told to move to a foreign land – they have ownership of the trees for their own benefit. Women and kids are responsible to collect firewood and with the project activities, they will have access to firewood in their own property, which reduces their workload	Duty sharing will help address the issue and reduce the load.

			comparing to the situation before the project implementation. However, in some cases especially during the draught it might lead to additional work of watering the seedlings, which will be on done by the women.	
	6. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?	Potentially	The project will make it possible for women to benefit more on forest resources at home and reduce reliance on their spouses. Therefore, they will be respected more. However, this might arise especially during the harvesting periods. Men might take all the money gained from the harvested trees. Men traditionally own property and will control the sale of timber products	Since everyone in the family is included in the initial phase of the project, the same will happen during the harvest time. They will distribute different benefits amongst different family members. For instance, women will gain firewood from pruning while men will get timber.
	7. Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of	No	The activities implementation will make in areas when there aren't crops or where agroforestry systems could be adopted, aiming to increase the yield of that area. This would not limit in any manner the ability of women related	

	women and men in accessing and managing environmental goods and services?		to the use, development and protection of the natural resources. Also, women are fully engaged and included in the full process of the project. Women are fully engaged and included in the full process of the project.	
	8. Is there likelihood that the proposed Project would expose women and girls to further risks or hazards?	Potentially	When the trees planted grow up, they might form forests with thick canopies that can attract bad people who can hide in them. This can put the women, who are in most cases the ones who go to shopping centres to buy household items, into potential risk of being mugged or raped.	This can be mitigated through regular pruning. Thinning and felling off of some trees will also help by availing spaces in which one can clearly see through the woods.
Principle 3 - Community Health, Safety and Working Conditions	1. Is there a risk that the Project shall increase community exposure to health risks which may adversely affect the health of the workers and the community?	Potentially	The project activities like pruning, thinning and harvest could put people in the community at risk.	The people of the community will be trained to carry out the project activities adequately and to prevent accidents.

Principle 4 - Cultural Heritage, Indigenous Peoples, Displacement and Resettlement	1. Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations, or practices)?	No	The establishment of the plantations will be carried out within the community premises, where there is no presence of places of cultural or religious importance for the community.	
	2. Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	The reforestation will be implemented on private land and includes a component of sustainable agriculture. In addition, the project will only include landowners that are willing to join the project.	
	3. Does the Project require any change to land tenure arrangements and/or other rights?	No	All the participating farmers must be the actual land owners and should provide sufficient authority over the land including title deeds and/or allotment letters.	
	4. For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?	Potentially	Only land owners with title deeds allotment letters will participate in the exercise especially because it is a long-term project. However, in some cases, the owner (father) might have subdivided the land to children but not given them a title deed. Therefore, there might be no clear agreements about who owns the project.	As the project starts, the rightful owner of the land (with the title deed) should give the permission to participate in the project
	5. Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	NA	There are no people who fit the definition of "indigenous peoples" within the project area. All the residents are immigrants from different parts of Kenya	
Principle 5 - Corruption	1. Does the Project involve, or be complicit in or inadvertently	No	"WWF International has a zero-tolerance principle to fraud and corruption. As an organization that condemns and fights corruption as one of the key drivers of poverty,	

	contribute to or reinforce corruption or corrupt Projects?		environmental degradation and bad governance, it requires its own staff and co-contractors at all times to act and comply with its zero-tolerance principle by fully conforming to all procedures and policies adopted to prevent corruption and fraud in our offices." (World Wildlife Fund (WWF), 2012) (See annex 6) Additionally, the entire project was informed by Free Prior and Informed Concept (FPIC) and all the participants agree that the process was transparent.	
Principle 6 - Economic Impacts	1. Is there any forced labour?	No	None of the land owners have employed workers. All the tasks will be performed by the family members.	
	2. Is all employment in compliance with national labour and occupational health and safety laws, with obligations under international law, and consistency with the principles and standards embodied in the International Labour Organization (ILO) fundamental conventions?	Yes	Many farmers will work (casual labour) for each other based on traditional arrangements which is effectively a reciprocal agreement between communities to work for each other. In addition, all the employees working for the project participant institutions are working under conditions in compliance with the ILO fundamental conventions.	
	3. Can workers establish and join labour organisations?	Yes	None of the land owners have employed workers. All the tasks will be performed by the family members. In addition, employees from the project participant institutions have no restrictions to join and establish labour organizations.	

	4. Working agreements with all individual workers shall be documented and implemented. These shall at minimum comprise: (a) Working hours (must not exceed 48 hours per week on a regular basis), AND (b) Duties and tasks, AND (c) Remuneration (must include provision for payment of overtime), AND (d) Modalities on health insurance, AND (e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND (f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave.	yes	The traditional arrangements between farmers are based on informal agreements. All the labour will be provided voluntarily by the family members and their neighbours and therefore the conditions are not applicable. In addition, the project participants institutions have working agreements with all the workers and they make sure that the minimum stated in the assessment question will be met/respected.	
	5. Is the project financially sustainable (beyond the 7 year period of investment)?	Yes	For the first seven initial years or until the project reaches 42,000 tCO_2, the project relies on funds from Coop Switzerland. After that period, the project relies on the sale of carbon credits. Therefore, the project is financially sustainable.	
	6. Are there any risks to the local economy from this project?	No	On the contrary, the goods and services resulting from the diverse project activities will increase the income of the families involved with the project as well as enhance the climate and biodiversity. Hence, there are no risks to the local economy for the project.	
ENVIRONMENTAL & ECOLOGICAL SAFEGUARDING PRINCIPLES				

Principle 1 - Climate and Energy	1. Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	GHG emissions will be reduced because of carbon sequestration. No use of fertiliser. Soil preparation is the same as baseline.	
	2. Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	No power or fuel source will be required to plant the trees or other project activities. On the contrary, the project activity will increase the availability of firewood in the participant's land.	
Principle 2 - Water	1. Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	Yes	Project is intended to have positive impact on water resources through improved filtration and reduced soil erosion, reducing the flooding potential, high seasonal flow variability and water scarcity.	
	2. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? If 'Yes' or 'Potentially' proceed to next question	No	The project will enhance water holding capacity of the soil and also bind the soil together. The tree cover will also reduce wind and raindrop erosion.	
	3. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	Yes	Some portions of the project area are susceptible to erosion and water body instability. However, the project activities will reduce the erosion risks and water body instability.	In the project area, some of the project participants may join this project to control erosion (through planting of native trees

				along riparian zones).
Principle 3 – Environment, ecology and land use	1. Does the Project involve the use of land and soil for production of crops or other products?	Yes	Crop production is envisioned within the agroforestry system.	Farmers with sufficient land will establish woodlots while those with less land will use agroforestry systems to combine tree planting with crop production
	2. Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	The trees will help reduce the adverse effects of weather and natural disasters.	
	3. Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?	No	Only certified seeds from a single known source (KEFRI) will be used and no GMOs will be used in the project activities.	
	4. Could the Project potentially result in the release of pollutants to the environment?	No	There will be no use of machinery or other.	
	5. Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	No	No chemicals are used to grow or manage most of the trees.	

	6. Will the Project involve the application of pesticides and/or fertilisers?	Potentially	*Cupressus lusitanica* can be infested by aphids and pesticides are used to control it. This has only occurred once during the last 3 decades in the project area.	
	7. Will the Project involve the harvesting of forests?	Yes	The project only includes areas that have had no trees for at least ten years, but harvest will be accepted.	Areas where harvest will occur, the project participants need to replant those areas after harvest to make sure the area will be covered by trees for the whole project crediting period.
	8. Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	Yes	One of the management systems adopted is agroforestry and this alteration has a positive impact. Agroforestry systems in the region lead to an increase in soil fertility, resulting in increased crop yields (approximately 15% according to WWF-Kenya experience in this area). In the event that we have many people opting for woodlots and replacing crops with trees, there might be a reduction in the annual crop production.	In case this arises, land use zoning and agroforestry planting regime will be encouraged to the farmers.
	9. Will the Project involve animal husbandry?	Potentially	Some grazing will be allowed in the reforestation areas once trees have established i.e. beyond 5 years.	

	10. Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	All the reforestation will take place on private land and no trees will be planted in protected areas. Also, planting is only allowed in areas that were no forest for at least 10 years before the project start date.	
	11. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?	Yes	These include: mitamaiyo, mitarakwa,munderegu, mukeu,mucerage, muiri, muringa,Muu, muthiga, mikurue. The presence of Mwiri, mutarakwa, muthiga, muhugu (teclea dignorum) mitamaiyu have reduced in the project area and they used to be there. *Acacia xanthophloea, Olea africana, Prunus africana*, Sisigium, Fig trees, *Juniperus procera.* Much of the endangered species are nearly finished. They are so much valued and won't be affected at any time.	
	12. Does the Project potentially impact other areas where endangered species may be present through trans-boundary effects?	No	The project will be implemented in areas degraded and no endangered species are present on those areas.	
	13. Can the project bring conflicts with the neighbours	Potentially	The father might have initially done the agreement with the neighbours but later the neighbour quarrels with a son on the same matter. Inheritance issues where the trees might have been there for about 28 years. but after land division maybe the sons don't want them anymore, but the mother still want them.	Being trained to keep the required distance from the border while planting the trees to avoid quarrels.

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

Thirteen meetings were carried out as part of stakeholder consultation. Working through the WRUAs, CFAs, a forester and the local administration across the basin, stakeholders were invited to the LSC meetings through Text messages, phone calls emails and public notices one month prior to the meetings. Follow up phone calls were made to confirm participation. The choice of the venues, dates and times was made by the lead institutions in consultation with the local administration as the period during which the LSCs were conducted there was political instability in Kenya and therefore the government needed to be aware of all the public meetings.

The objective of the meeting and the overview of the discussion are explained to the participants as part of climate setting and as a request to participate as individuals and or families who own land and can make independent and honest decisions without being coaxed to do so. The language (Kukuio, Massai or Swahili) to be used was decided by the participants, including the need to use a translator when they consider it appropriate. The report presented during the LSC meeting was in English and Swahili. The Gold Standard Procedure Requirements and Guidelines were followed for the local consultation design.

E.2. Summary of comments received

The most relevant comments taken from the local consultation with stakeholders are presented below. The complete information on the comments and assessments collected during this process are included in the final LSC report.

Why should the community use the credit money in building a communal project while the trees will be planted on individual land? There was a concern that the farmers planting the trees on their own farms should receive the full benefits, have liberty to choose what to do with the money or receive a percentage of the money for personal use rather than being compelled as a community. (Murwaki-Upper Turasha Kinja, Aberdare-Kiburu, Lower Malewa, Upper Malewa, Ngondi, LSCs)

The individual farmers have liberty to choose what to do with the money and therefore the community was made to understand the comment given by raising the question. This was provided just as an example of what they can decide as a community and also what they can do with the money gained from the carbon credits, if they are willing to go in that direction.

Is it allowed to cut a full-grown tree for firewood or selling? (All the LSCs)

Yes, once the tree has grown and requires pruning, you can prune and use the branches as firewood or cut a few trees, but in that case you need to replace the trees immediately so that the project remains viable.

What kind of trees should be planted/are acceptable by the project? (All the LSCs)

The species to be planted depend on the farmers' preferences, tree species available and the planting mode selected by the participating farmers. E.g. a farmer doing agroforestry might consider planting species such as gravellier, prunus, casuarina, Olea, etc. while those doing woodlots might consider cypress and pine. The overall objective is to have a Native: Exotic ratio of 51: 49. All trees seeds should be certified by KEFRI.

Will the project include those that have already established woodlots and are interested in the project? (upper Turasha kinja, Wanjohi, Middle Malewa, Upper Gilgil and Aberdare-Kiburu CFA LSCs)

The project does not provide for this. It requires that the land should be bare for about 10 years before being eligible for the program.

GPS will be used to record the positions of the farms interested in the project and then they will be overlaid with the eligibility map to determine whether they are eligible or not. In addition, the seedlings to be planted on the farms for this project need to be certified.

How long is the contract; since one might think of rotating the land portion for planting something else or some more trees? (Wanjohi, Mkungi-Kitiri, Upper Turasha Kinja LSCs)

The funds are secured for 7 years; however, the project will run for 30 years, mainly from the sale of Carbon credits and other benefits from the trees.

Can the participating farmers receive carbon credits before 7 years? (Upper Turasha Kinja, Wanjohi, Mkungi- Kitiri LSC)

The trees must be mature enough to guarantee generation of carbon credits. The trees are anticipated to have reached this stage after the seventh year or above. This is the reason why the carbon credits will be generated from year 7 and over.

The carbon credits will be generated before but will be used by a company to offset its emissions.[5]

What is the name of the project? (Geta CFA LSC)

Lake Naivasha Basin Reforestation Project

Is there another group in the area that have been promoting the same kind of a project for carbon credit? (Upper Turasha Kinja LSC)

No, there is no similar projects in the area, though there is an organization that attempted the same in Aberdare forest, but it did not go well because the local communities near this forest were never involved in the design phase. Their inputs were never considered before the project started. Moreover, this was not carried out in the gazetted Aberdare forest, while Lake Naivasha Basin Reforestation Project will be carried out in individual farms.

Who will get the credit payments after the initial owner dies? (All the LSCs)

The person who inherits the land will be entitled to the carbon credits generated. But this is subject to whether they will continue or not with the contract terms. (Annex 5)

What happens if the owner plants the tree and have the agreement with the organization but later sells the land to another person; who will get the Credits? (All the LSCs)

In order for the new owner to receive carbon credits, he/ she must commit to and abide by the Gold Standard, stated earlier and which shall also be availed in the contract.

[5] This comment was not clearly answered during the LSC, therefore during the feedback round, more details and a clarification will be provided.

The issue of inheritance; where the father for instance dies and leaves the land with the trees but subdivided to the sons – can the project in such a case still be valid and who receives the payment? (Upper-turasha Kinja, Geta, Mkungi Kitiri, Wanjohi, Gilgil, Tumaini LSCs)

The benefit can be **subdivided** amongst the new owners as long as they continue to commit to the project.

Are fruit trees eligible for the carbon credit project? (All the LSCs)

Some of the fruit trees such as avocados might be eligible since they can survive for a long time and are classified as trees while others like oranges and tree tomatoes are classified as shrubs and therefore will not be eligible for the project. In addition, in the case where a farmer will need to plant fruit trees, the cost of buying such seedlings will be shared between the project and the farmer. This is because the cost of buying fruit seedlings is higher than buying tree seedlings and this might lead to higher budget implications. The cost of purchasing a tree seedling is set at KSh 15 in the project.

What Kind of species will be eligible for the project? (All the LSCs)

There are some species good for agroforestry e.g. mukorombothi, mwiri, grevelia, prunu etc. the community must have the kind of species it wants to plant on its farms, but in most areas this was not completely resolved. It will be done during registration and other trainings, once the community will select the species they would like to plant on their farms. But in case they select the species that won't be eligible for the project, they will be advised and supported.

How will the project support the land owner in the issue of air cleaning? (Middle Malewa LSC)

When the project will be in the place and working, then the air cleaning will be universal and will benefit all the people in the area and in the whole planet at large.

How will the nursery owners in the area benefit from the project since previously there were other donors who supported in starting of the nurseries and have been supporting in buying seedlings from them but in understanding, this project is focusing on new/different nurseries thus meaning the existing ones will be left out. (Geta CFA, Middle Malewa, Aberdare-Kiburu CFA, Upper Malewa, Mkungi Kitiri LSCs)

A few of the existing nurseries from the area were selected and guided by the requirements of the project and the way in which certified seedlings should grow in accordance with the requirements that will then be refunded/bought by the project and distributed to the community within this region. Other projects will continue buying seedlings from previously existing nurseries.

Will the project be started and then after sometimes the donor neglects it leaving it to die and the community be left without guidance: "This have been so common with other projects"? (Geta CFA, Middle Malewa, Aberdare-Kiburu CFA, Upper Malewa, Mkungi Kitiri LSCs)

The project is expected to run for at least 30 years, sustainability is key. Monitoring will be done for each performance certification i.e. once in 2020/2021 and once in 2023. A community-based monitoring system will be established to generate local capacities and bring further benefits to the participating communities, as well as giving them ownership of the project.

In addition to the monitoring undertaken for the performance certification, the project implementation team will carry out frequent monitoring checks (estimated to be every three months) for the continuous

assessment of the project success and to help identify project risks at an early stage. This monitoring will be done using ODK[6] to keep records of all data collected.

Are people with small pieces of land like 0.5 of an acre eligible for the project? (All the LSCs)

Yes, they are also eligible for the project since they can plant the trees along the boundaries of their farms or in an agroforestry manner.

Can the community join hands and do a group plantation for the project? (Middle Malewa LSC)

This is possible but they will need to have an agreement/arrangement with the person in charge of the public lands e.g. the chief, the parents and board of a school etc.

In derelict land such as quarries and other degraded public land; can the project support in the rehabilitation of such? (Ngondi, Aberdare Kiburu CFA, Geta LSCs)

Yes, the project can support rehabilitation of public areas but this will require prior consultations with the owner of such places and collection of information about how big the area is in order to determine what kind of rehabilitation will be done.

Can the project assist in the provision of water in areas that do not yet have water so that it can assist in the watering of trees while they are still young during the dry seasons? (Mkungi Kitiri WRUA)

This can be done in other arrangements and other projects in collaboration with the local community and other organizations. E.g. construction of water pans and installation of dam liners for harvesting run off. However, it will require a plan and a proposal that demonstrates what is really required and what can be presented to different donors to support a specific project, according to their policies.

Is the project including the trees that had already been planted; if so, can one be allowed to cut them down or prune them to plant the species provided by this project? (Middle Malewa, Lower Malewa, Upper Gilgil, Mkungi kitiri, Wanjohi LSCs)

No, the project does not interfere with the already existing trees. The project aims to improve the tree cover in the basin and it is not recommended to cut the already existing trees. Also, as one of the eligibility, the area to be planted by these trees should not have been covered by trees (Forest) for at least 10 years.

Who are eligible for the project and what are some of the eligibility conditions? (All the LSCs)

The project focuses on the lands where trees have not been in the last 10 years. A map will be used to decide on the legitimacy of these farms and ensure that those recruited will belong to the eligible category. Prove land ownership and compliance with the terms of contract will also be some of the other conditions to be considered.

When will the project start? (Upper Tursaha Kinja LSC)

The project started in 2017, (development of Key project information, project design document and work plan). The first 5 LSCs were also made at the end of 2017. Planting will take place during the long rains of

[6] O.D.K. (Open Data Kit): Is a suite of tools that allows data collection using mobile devices and data submission to an online server, even without an Internet connection or mobile carrier service at the time of data collection. You can collect data remotely without an Internet connection or cell carrier access. Gather text, numeric data, media and more with a mobile device. Then, host your data online using Google's powerful hosting platform, Google AppEngine, and visualize your data as a map using Google Fusion Tables and Google Earth. https://opendatakit.org/

MAM[7], beginning April of 2018. The planting will take place in three years during the same season, beginning 2018-2020.

Will there be fencing provided by the project to protect planted trees? (Mkungi Kitiri LSC)

No. Trees are expected to be protected by the owner of the farm, more precisely the person who has registered the project. For instance, they should be protected the same way the crops are protected. If fencing needs to be done, this local arrangement will be executed by the farm owner, which is not prohibited.

In the case that some of the trees planted die before maturity, who will be responsible for replacing them? (Al the LSCs)

Trees that die accidentally will be replaced by the project. However, each farmer will be responsible of taking care of their trees. The progress will be monitored by selected farmers (coordinators) who will identify the small hitches and the progress of the project. To ensure that a higher survival rate is achieved, the project will offer technical assistance through the use of officers from KFS and Agriculture, for instance, in the case of some of the tree species such as *Cupressus lusitanica* being infested by aphids, the best solution will be provided.

Brief description of Carbon credit? (Kianjogu, Mkungi kitiri, Geta CFA, Aberdare Kiburu CFA LSCs)

Carbon credit is a term for any tradable certificate of one tone of carbon dioxide or the mass of another greenhouse gas with a carbon dioxide equivalent to one tone of carbon dioxide. It is essentially a permit which allows a country or organization to produce a certain amount of carbon emissions, which can be traded.

The farmers have to decide how they want to use the funds provided by the carbon credits. Since these funds are relatively small, they need to look at the benefits of this project at a different angle. For instance, what are the other benefits they gain from the trees.

Can orders of tree species required be taken in advance for those people interested in the project then provided during the planting season? (All the LSCs)

Forms will be availed in the WRUA office where farmers that are willing to participate in the project will write down their names and the number of trees that they would like to have in their farm as well as the farm acreage they are willing to offer for planting. This form will design the basis at which trees will be distributed. During distribution, the farmers will also write what species of seedlings they have received. In case of any deficit, this will be covered during the next planting season.

Will trees be provided to youths who don't have ownership of the farms but after consulting their parents/ one who has authority over the land to get a piece? (Wanjohi, Mkungi Kitiri LSCs)

During implementation/ planting, the owner of the farm is the one who will be consulted before planting. The farm owner is the one who will decide where the planting will take place.

Fruit trees to be planted include avocados that can survive in the area, meaning that these must also be certified. Small portions of this can be availed so that famers can mix with other trees species, though will need some extra cash from the farmer since the project can only provide ksh 15 per seedling, and some of the cost for these fruit tree seedlings surpass this.

[7] March April May (MAM) rainy Season: these are the estimated months when long rains in the region are usually received.

The species have already been decided by South Pole and WWF with the help of local farmers. In case more species will be needed, these can be added in the subsequent years ie 2019 and 2020 since seedlings for 2018 are already in the nurseries, and this will be difficult to change. Other factors to have in mind while choosing to add seedlings, is the cost per seedling and the Native: Exotic ration which should at all cases be maintained at 51: 49 respectively.

Can the project help people establish tree nurseries for the Project, for those who are interested in the project but don't have large pieces of land for plating? (Geta CFA, Middle Malewa, Aberdare-Kiburu CFA, Upper Malewa, Mkungi Kitiri LSCs)

No. All tree seeds planted for the project must be certified from KEFRI. A receipt of purchase to confirm this, shall be provided before WWF obtains seeds from the nurseries.

Can the project bring conflicts with the neighbors or wildlife? (All the LSCs)

Conflicts might arise with the neighbors especially because of the transboundary boundary issues. When trees are planted near the boundaries, they may extend their roots and canopy to the neighbors' farm, thereby affecting crop production. To remedy this, trees will be planted at a specific distance from the boundary. The appropriate planting buffer distance from the neighbor's boundary will be determined by the Kenya Forest Service and Agricultural Officer in regard to the tree species planted.

Human wildlife conflict:

Monkeys might find home in the grown trees which might interfere with their crops. In case this happens, Kenya Wildlife Service officers are used to manage animals such as the monkeys when present in the area.

Keep the required distance from the border while planting the trees to avoid quarrels.

There are people in other areas (Laikipia) doing carbon credit and are paid 15ksh per tree/year, is this project related to that? (Lower Malewa LSC)

The Laikipia Project is not directly linked to this one although they could be similar. However, according to this project, the credits will be Kshs 1.50 per tree per year. It is therefore important for people to consider the benefits they will get from the trees and not the monetary value.

One of the Local stakeholders wanted to know why the project time frame (30 years) was too long

This is to allow the slow growing trees especially the hard wood such as red cedar and ficus which takes considerably long time to mature. However, in the course of the implementation of the 30-year project, mature trees can be harvested and replaced with new tree seedlings. Chief Magdalene Kariuki of Murwaki area (Upper Turasha Kinja) attributed the low turnout of the meeting to Kenya Bureau of Statistics census exercise which have been ongoing in the area.

Overall, the comments expressed by the community about the project during the meetings were good. The Stakeholders consider that the project allows uses indigenous species that had been lost over time. They state that trees can benefit rain cycles, air quality, favour local fauna, improve soil productivity and reverted the high deforestation that the area has suffered in previous years.

E.3. Report on consideration of comments received

During the local consultation and after the blind exercise, the stakeholders had the opportunity to ask questions and clarification to the assistants about the project. All the comments made were collected and those comments that suggested some modification in the project activities were evaluated in the local consultation report considering the objective and scope of the project.

The table below shows the evaluation of the community's comments and the justification for them being taken (or not) into account.

Stakeholder comment	Was comment taken into account (Yes/ No)?	Explanation (Why? How?)
Will the project be continuously supervised by donors for avoiding that the project die?	No	The project will receive funds from the donor for the first seven year, but not for the whole crediting period. However, the project sustainability is key; therefore, the monitoring will be done for each performance certification i.e. once in 2020/2021 and once in 2023. A community-based monitoring system will be established to generate local capacities and bring further benefits to participating communities as well as giving them ownership of the project. The project implementation team will carry out frequent monitoring checks (estimated to be every three months) for the continual assessment of project success and to help identify project risks at an early stage. This monitoring will be done using ODK to keep records of all data collected.
Will there be fencing provided by the project to protect planted trees?	No	Trees are expected to be protected by the owner of the farm, the one who has registered for the project. For instance, they should be protected the same way the crops are protected. If fencing needs to be done, a local arrangement will be executed by the farm owner, which is not prohibited.
In the case that some of the trees planted die before maturity, who will be responsible for replacing them?	Yes	Trees that die accidentally will be replaced by the project just during the first three years. However, each farmer will be responsible of taking care of their trees. The progress will be monitored by selected farmers (coordinators) who will identify the small hitches and the progress of the project. To ensure that a higher survival rate is achieved, the project will offer technical assistance through the use of officers from KFS and Agriculture, for instance, in the case that some of the tree species such as *Cupressus lusitanica* being infested by aphids, the best remedy will be provided by them.
Can the project help people establish tree nurseries for the Project, for those who are interested in the project but don't have large pieces of land for plating?	No	The project will guide the establishment of the tree nurseries but the owners must buy certified seeds from KEFRI. An official receipt shall be provided as a confirmation before WWF obtains seedlings from the nurseries.
Can the project bring conflicts with the neighbours or wildlife?	Yes	Conflicts might arise with the neighbors, especially the transboundary boundary issues. When trees are planted near the boundaries, they may extend their roots and canopy to the

		neighbors' farm, thereby affecting crop production. To remedy this, trees will be planted at a specific distance from the boundary. The appropriate planting buffer distance from the neighbor's boundary will be determined. Human wildlife conflict: Monkeys might find home in the grown trees which might interfere with their crops. In case this happens, Kenya Wildlife Service officers are used to manage animals such as the monkeys, when present in the area. Keep the required distance from the border while planting the trees to avoid quarrels.
Stakeholder wanted to know if tree seedlings will be purchased from nurseries within their Water Resource Users Association (WRUA)	Yes	For this year, the target of tree seedlings to be planted was relatively low in comparison to the subsequent years. And as such, it was not logical to consider having every WRUA with its nursery. For the subsequent years (2019 and 2020), since the number of tree seedlings required will be higher, the number of tree nurseries will increase. This is when there is a possibility of having every WRUA with their own tree nursery.
Will those with fruit tree nurseries be considered in the project?	Yes	This will depend on the required number of fruit trees especially avocado. Again, as stated earlier, much of the trees to be planted will be non-fruit trees, since the project provide kshs 15 for every tree seedling and fruit trees surpass this amount. Those farmers interested with fruit trees will have to incur extra cost to purchase.
Time limit for the LSC meeting (More time should be availed)	Yes	For the coming awareness campaigns, more time will be dedicated taking into account the aim of the meeting in a way that enough time will be availed. In addition, before the actual plantation commences during the long rainy season (MAM) beginning April, we shall have met the interested farmers in the project for training and further discussion. Regular awareness campaigns will also be carried out before this period so as to get the input of those that did not attend the Formal ones.
Chief Magdalene Kariuki of Murwaki area (Upper Turasha Kinja) mentioned that the community in her Location have large tracts of land, especially along the rivers, and therefore they will convert that land to tree planting and use the chance to benefit from the project.	Yes	This was addressed in the planting regimes (i.e. Agroforestry and woodlots) that are included in the project. Since there is no maximum limit established for the plantation size, they can choose to reforest an area in their farm as long as this is in line with the project design.
Will they also consider the issue of long-lasting species like Cider	Yes	Cider and other species that are good for poles will be planted in all the areas where they do well.

that makes better poles and timber?		

Appendix 1. Contact information of project participants

Organization name	South Pole
Registration number with relevant authority	
Street/P.O. Box	Technoparkstrasse 1, 8005
Building	
City	Zurich
State/Region	
Postcode	
Country	Switzerland
Telephone	+41 43 501 3550
Fax	
E-mail	c.grobbel@southpole.com
Website	www.southpole.com
Contact person	Christoph Grobbel
Title	
Salutation	
Last name	
Middle name	
First name	
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	

Appendix 2. Summary of post registration design changes

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